YACHTING

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Outboard Wonder Motors

Simplicity of Operation and Dependability of Service Are Two of the Good Points of the Modern Portable Motor, Which May Be Easily Handled by All the Members of the Family, and Quickly Attached or Detached from Any Kind of Boat

SOME fourteen years have passed since the first portable motor ever seen in this country was exhibited in a western hotel by a French traveler who had brought the then novel mechanism from Bordeaux. It was a decided novelty and for this reason attracted much attention among manufacturers of gasoline motors, and many of them were enthusiastic in the belief that there was a big future for a motor of the portable type carefully constructed on the best engineering lines and time has proven this to be so.

The sailing yacht's tender equipped with one of these little machines comes in handy at all times and especially when the wind is light. Powered thus one has all the advantages of an auxiliary without the discomfort of having a motor installed in the cabin or under the cockpit floor. Rowing or whistling for a wind will soon become lost arts now that the outboard motor is coming into its own

This original portable motor was of the vertical cylinder type and like all early models was heavy, bulky and complicated in mechanism. The first few attempts to produce a light and simple form of outboard motor were not very successful until one manufacturer specialized on this particular type and in a few years put on the market what was undoubtedly the prototype of the models now on the market to-day in the most modern form.

From its introduction the development of this particular type of motor has been remarkable and improvements in design and efficiency have been rapid because of the wide demand and usefulness of the portable motor, which may be utilized to propel boats of a variety of designs. It is for this reason that the outboard has been firmly established in much less time and on a more substantial basis than perhaps other novelties of a similar kind. At the present time there are more than ten different makes of these motors and all of them are reliable and will perfectly fulfill all the claims of the manufacturer.

To those yachtsmen who enjoy fishing an outboard-motor powered canoe is an ideal craft. And as all the better types of outboard motors are equipped with attachment fittings that may be used with any type of canoe the problem of installation is a simple one. A canoe so powered is fast at full motor power and, because of refined lines, progresses at all speeds with a minimum of water disturbance, and therefore is splendid for trolling

Adaptability is without doubt the chief factor for the wide popularity of the portable motor, and many a yachtsman possessing a cruiser, speed launch or runabout, finds pleasure in an outboard motor, for this handy little power plant is useful in propelling a tender and is very largely used as the motive power of small light rowboats, skiffs and canoes for day sailing and for fishing and hunting. In the matter of speed, the portable motor is fully the equal of any other type of marine motor, but because of its portable light weight construction, its use is logically confined to boats of light construction, rather than employed to drive heavy work boats. True, all the best makes of portable motors will stand up under a greater strain than they were built for, but this misapplication of its proper service is scarcely a fair question to consider in its use.

In the early days of the motor the principal ambition of the makers was to apply power in a portable form which could be easily attached to the boat, which could be propelled mechanically and thus do away with the oars. The value of the mechanically propelled boat was of course particularly demanded by vacationists and sportsmen, but the adaptability of the design to all kinds of boating requirements at length opened up a much wider field and has resulted in manufacturers putting on the market a variety of sizes and designs.

While there is a growing demand for a detachable motor in sizes of 5 H. P. or more, and weighing up to 150 pounds, the true portable motor must remain of the tourist form, of 2 to 3½ H. P. and weighing

In the fall the outboard motor is a handy adjunct to the gunning boat, and many an arm weary row is turned into a pleasure trip to the places where the birds pause to feed if an Evinrude, Arrow or Caille motor is part of the boat's equipment. The designers of these motors have so built them that in a few minutes' time practically any craft may be converted into an efficient and complete motor boat

from 50 to 70 pounds. It is motors of this class which the yachtsman and sportsman find most useful, and this form has been improved and developed during the past five years until it has reached a very high standard of excellence. In contrast to the early models, some of the best outboards of to-day are equipped with high-tension magnetos built into the flywheel and giving the dependability of a waterproof ignition system. Certain other motors are provided with an adjustable bracket by which the motor is quickly and firmly attached to boats having different types and angles of sterns. Reversible propellers, controlled by a lever operating in a rachet-guide are likewise furnished on other models, by which the speed of the motor may be changed, forward or reverse, without changing the direction of the motor.

All modern makes of detachable motors are so well designed and well balanced that they are very easy to start. A simple spin of the flywheel is sufficient to start the motor upon the magneto, and self-starting attachments have been perfected to do away with all cranking. Mr. Evinrude, of the company which bears his name, is accredited with the production of what is generally conceded to be the first American-made portable motor, and Koban, Kalish, Cullen and Waterman are some of the names prominently associated with the development of this useful type of marine engine. All outboard motors may be said to conform to practically the same models, inasmuch as the basic principles are virtually the same. Every manufacturer has, of course, worked out the designs of his own motor in his own way and constructional details differ in the various makes in the same manner that marine and automobile motors differ from one another.

The good points of the foremost makes of portables are the direct result of correct design, tested materials and careful and accurate machine work. While the 2-cycle principle is most widely used, one make of portable motor combines the desirable features of the 2-cycle and 4-cycle types by means of a double-system of ports, which prevents the fresh fuel charge from going out through the exhaust, and the ports are so arranged that crankcase explosions cannot occur even after long service.

Cylinder, pistons and compression rings are now accurately ground from special cast iron and crankshafts are formed of chrome nickel steel, while crankcase and connecting rods are made of durable phosphor bronze. Although the magneto has now largely replaced the battery for ignition and is generally considered as well worth the slight additional cost, some manufacturers supply their portable motors with either system.

Among the newer refinements of the outboard is the underwater exhaust—a neat, compact and efficient device which makes the exhaust practically noiseless without retarding the speed of the engine by setting up back pressure. The reversing propeller is used in some makes to drive the boat either forward or back, and steering is likewise done in the usual way. In models of portable motors without rudders the tiller clamp fits over the propeller sleeve and swinging the tiller to right or left causes the propeller to swing in the same direction.

The many new improvements made during the last year or two has widened the use of the portable motor to a considerable extent. With special and adjustable brackets the motor can be easily and firmly attached to all types of sterns. For shallow water running there is a special tilting attachment. This is clamped to the stern of the boat and the motor is in turn clamped to the bracket. This device allows the motor to swing clear of the water without making it necessary to detach it from the boat, and the craft can be beached without removing the engine.

The double and single cylinder motors are equally popular for driving the under water propeller type of portable motor and two well known makes use the air-propeller drive. In one of these popular motors the two cylinder horizontal opposed motor swings a 32-inch air propeller of laminated walnut and having less resistance to overcome maximum speed is obtained with comparatively light weight and relatively less horse power. The air-drive portable is of course weedless and the boat or canoe may be driven over the lily pads and weeds and in very shallow water. As the regular portable motor may be used for stationary purposes for driving a washing machine, cream separator or other light machinery, by merely removing the propeller and substituting a small pulley, so can the air drive portable be used for driving an ice boat, thus making use of the motor for winter sport as well as summer boating.

Prominent among the best known and most dependable portable motors of the underwater propeller design are the Arrow, Caille, Evinrude, Koban, Ashbrook and Wisconsin motors. The air-driven propeller type is represented by the Aerothrust and the Airdrive motors. A general summary of the good points of the several types of popular outboard motors is only possible in a short article of this kind, and the prospective purchaser of one of these handy power plants may receive much interesting information by writing to the Buyers' Guide Department of *Yachting*.

The air-propeller type of portable motor is an all season engine, equally useful for propelling the boat during the summer season and furnishing power for driving the ice boat or sled during the cold months of the year

Astronomy as Related to Navigation

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WHILE a knowledge of astronomy is not necessary for the navigator, it is desirable that he should be acquainted with the few chapters which are closely related to the subject of navigation. Otherwise his work as a navigator becomes the exercise, by a feat of memory, of a mere rule of thumb, in the manipulation of his instruments and the application of the tables of the Nautical Almanac.

Fortunately the knowledge of astronomy which the navigator should possess is of a kind which will serve as the foundation for as much additional astronomical information as he may wish to acquire.

It is of vital importance that there should be built up in the mind of the student a clear mental picture or diagram of the relative positions and movements of all the astronomical bodies with which he has to do. So important is this that it would seem inadvisable for a reader to continue with this article, if it should tend in the least to disturb an already formed mental picture.

A BIRD'S-EYE PICTURE OF THE HEAVENS

If an observer could be removed from the earth and take the position in space marked with a star on Figure I, free to look in all directions into the heavens, and assuming that he was somewhat above the plane of the earth's orbit, i. e. on the north pole side of it, and near the position which the earth occupies about 21st September each year, and that he was somewhat outside the orbit, and that the light of the sun was reduced so that while visible it did not prevent a full view of the stars, and that it was possible for him to watch the heavens thus for a full year, he would be able to report about as follows:

An entire absence of motion of the sun and the stars, so far as he could observe with his eye or with any navigational instrument. This would be also true not for a year but for a lifetime.

The motion of the earth in its orbit is anti-clockwise. The daily revolution of the earth on its axis is also anti-clockwise. The pole of the earth is inclined about 23½ degrees to the observer's right. The pole is carried around the sun in the annual journey of the earth without changing its direction. The orbit is an ellipse, the major axis of which is only a little longer than the other axis. In fact the orbit is almost circular. The sun would be seen at the right hand focus of the ellipse.

All of the above matters are shown on Figure I, on which the seasons noted are those of the northern hemisphere.

The observer would note also in a year of observation that a number of planets were also revolving about the sun, in the same direction as the earth, in orbits only a little inclined to that of the earth. Of these, those near the sun would be advancing with greater speed on lesser orbits, and those outside the orbit of the earth would be advancing with lesser speed as the orbit was the greater. In fact, in a year's time, the outer planets would have moved but a short distance while the earth completed its yearly circuit. Of these planets, four would attract his attention most, viz., Venus, whose orbit is within that of the earth, and Mars, Jupiter and Saturn, the three which are next in order outside the orbit of the earth. The planets and the moon, which makes its monthly revolution about the earth, which is in fact a serpentine orbit about the sun, would be the only notable objects, other than the earth itself, and an occasional comet, as to which he could detect any motion whatever.

The universe, aside from these bodies, would seem to the observer a hollow globe, of which he was the center, dotted over with stars, all seemingly of infinite distance, and the one great fact from which his mind could not escape would be the apparent absence of all motion, either of the sun or any star. Nor could he in a lifetime, with his sextant to assist his eye, discover any relative change in their positions. No apparent displacement or change of position of the stars would be discovered by him if he could occupy alternately each end of the major axis of the earth's orbit, which has a length of about 186,000,000 miles, for the reason that the stars are at such great distances that the whole length of the major axis as seen from the nearest star would not equal 2″ of arc, and as to most of them, it could not be distinguished from a point without any ascertainable length.

The Nautical Almanac, hereinafter referred to as the Almanac, gives the exact position of each of the above named four planets in right ascension and declination for each day in the year, and of the moon for every two hours in each day in the year. Omitting these from consideration, therefore, it can be truly said that all the apparent movements, both in time and in space, of the stars and the sun are due solely to the motions of the earth itself.

THE MOTIONS OF THE EARTH

Two of these motions have been mentioned, viz., (1) its daily revolution and (2) its motion in its orbit. While the earth varies in speed at different parts of its orbit, it completes a full circuit in a definite time, which does not vary. And still more important to the navigator, its daily revolution on its axis is at an invariable speed, not only throughout the year, but from year to year. In truth, no change in this speed of daily revolution has been noted since the earliest days of astronomical observation, although the friction produced by the tides might have been expected to slow down such speed.

GRADUAL REVOLUTION OF THE POLE OF THE EARTH REQUIRES 26,000 YEARS

The motions of the earth in its orbit and its daily revolution produce the most notable changes in apparent position of the sun and stars, but there is a third motion of the earth with which the navigator has to reckon.

If the observer above mentioned could keep his position for about 26,000 years, he would see the north pole of the earth make one revolution in a clockwise direction, while maintaining its inclination of about 23½ degrees to the plane of the earth's orbit, as shown in Figure II. In this figure the line NS is the pole of the earth somewhat produced to define its position to the eye. The line CE is deemed to be the pole of the earth's orbit, and the slow change in direction of the pole (requiring 26,000 years to complete) is indicated by the circle and arrow.

PRECESSION OF THE EQUINOXES

The effect of this slow change of direction of the pole is to change in a clockwise direction the two points where the celestial equator cuts the ecliptic, the great circle in which the plane of the earth's orbit cuts the heavens. See Figure III.

These points are known as the vernal and autumnal equinoxes and they shift about 50″ of arc each year. In a full circle there are 21,600 minutes and these subdivide into approximately 26,000 spaces of 50″ of arc.

The vernal equinox (see Figure III) is the point on the celestial equator which the sun apparently passes about March 21st, and which is directly opposite the March position of the earth on its orbit,—that position, in other words, on its orbit which the earth itself reaches about September 21st.

The figures from 1 to 24 mark on the circle of the celestial equator the right ascensions of stars which lie on meridians in their respective directions from the center of the orbit of the earth.

The reason for this curious backward circle of the pole can only be here partially indicated as follows. The earth, by reason of

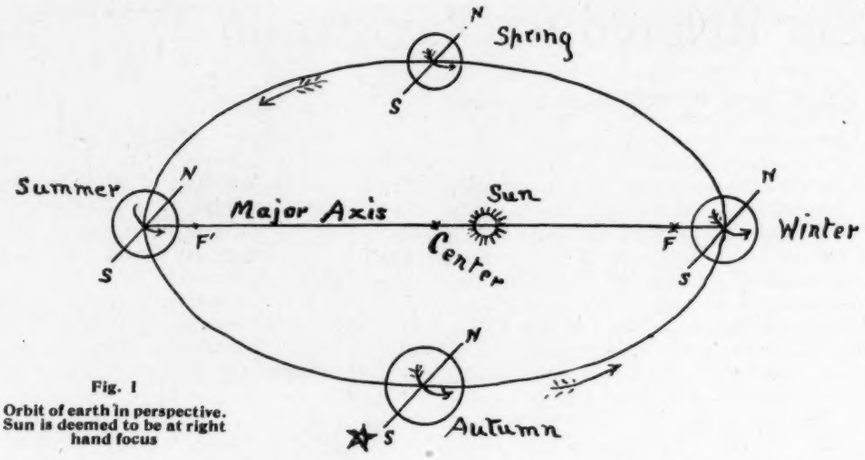


Fig. I
Orbit of earth in perspective. Sun is deemed to be at right hand focus

its daily revolution, has taken a form flattened at the poles and enlarged about the equator. The amount of this variation from a true sphere is an incident to the speed of rotation. Both the moon and the sun intermittently and in a varying and always small amount exert an extra pull of gravitation on the equatorial band of matter, so as to tend to make the earth stand with its pole perpendicular to the plane of the orbit, with the result that while such gravitational pull does not produce that result, its energy is expended in the slow turning motion as mentioned. If, on the other hand, the pull had been so exerted as to tend to cause the pole of the earth to become parallel with the plane of the orbit, the direction of the motion would have been reversed.

The annual slight change of about 50″ of arc removes the position of the vernal equinox each year in a clockwise direction, as shown in Figure III, so as to meet the sun and shorten by a few minutes the so-called tropical year, as compared with a sidereal or star year, which marks a true full circuit of the earth about the sun, when the sun, earth and some star are again in line, instead of the sun, earth and some shifting equinox. The tropical year is the year as commonly known. On the figure successive positions of the equinoxes are lettered a, b, c.

Of course this shifting of the equinoctial point is slowly progressive throughout the year, or about 4″ of arc per month, and is taken into account in the preparation of the Almanac tables. The best of sextants have a centering error of about 20″ of arc, i. e. it is not mechanically possible to produce a swinging arm with a smaller error in its pivot, so it is misleading to calculate results to a seeming greater exactness.

The reason for enlarging upon this subject, which has the formidable title of the Precession of the Equinoxes, is to make clear the reason for the slight monthly changes in right ascension and declination of the 55 navigational stars. (the shift in the position of the pole affecting the declination as well as the right ascension), and the reason for the annual variation in position of the 110 additional stars, of which the Almanac gives the right ascensions and declinations.

It will also give a slight idea of the infinite labor and exactness expended in the tables, when it is remembered that this slight progressive change affects every entry of position of the sun, moon and planets, as well as of the stars.

We may now dismiss this last subject as one which will but slightly affect the figures given in the Almanac, but which from its nature could not be entirely ignored.

PROBLEMS PRESENTED BY THE EARTH'S MOTIONS

There remains the problem presented by the motion of the earth on its orbit, as affected by its daily revolution around an axis inclined at about 23½ degrees to the plane of the orbit, and assuming that the axis or pole does not materially change its direction in space during the year.

It may be said that a circle is a mere special case of an ellipse both of whose axes are equal and whose foci have merged into the center. It would be most improbable that a heavenly body would happen to have such an orbit. The chances are greatly against it.

One of the difficulties of books upon astronomy is in the attempt to adequately diagram on a flat page matters which would require a three dimension drawing. This is particularly true when the subject is such that of necessity the reader must be included within the diagram, as for example in the seeming hollow globe of indefinite greatness, which is dotted by stars of the universe, there must always be some stars behind the back of the beholder,—a thing somewhat difficult to visualize. The mind of the student is not limited to a flat surface as is the diagram on the printed page. The student can build up, if he will, a mental picture in three dimensions which, by review, can be made both clear and permanent and which will be very useful.

Although the sun is among the heavenly bodies a very unimportant member, and by no means to be considered the center of everything, it becomes a convenient center for the astronomical student.

The path of the earth about the sun as already stated traces an ellipse, which lies substantially in a single plane. This plane cuts the starry heavens in an infinitely great circle, bearing the name of "the ecliptic."

Figure I, already referred to, shows this path of the earth, the ellipse being greatly exaggerated. It also shows the earth tilted with its north pole to the right and the motion of the earth about the sun, as well as the earth about its own axis, as being anti-clockwise. As already stated, it assumes that the person looking upon it is on the north pole side of the plane of the orbit, and that the lower side of the ellipse is nearer to the observer and that he is on the autumn side of the orbit.

All of these assumptions are, of course, arbitrary. One can place himself on the other side of the plane of the orbit or opposite any other point of the orbit. But having once adopted them, he cannot change his position with impunity. To do so would tend to break up the definite memory diagram, after which his knowledge of astronomical facts would be practically worthless.

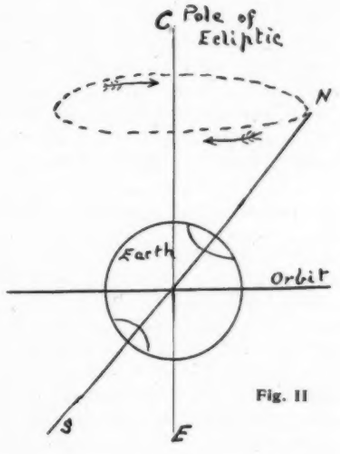


Fig. II

Figure I should become a clear cut memory diagram and other astronomical information as acquired should be visualized even to the exclusion, if necessary, of some other astronomical information.

The importance of this point has not always been sufficiently in the mind of astronomical writers, who have not realized how much confusion they were introducing into the subject by diagrams showing the earth with its pole tilted to the left, and otherwise making it clear that they did not expect the student to keep any clear cut image of the situation in his mind.

As shown in Figure I the oval is in considerable perspective and thus foreshortened. The ellipse as drawn is a true ellipse, but its actual foci, as an ellipse, are at the points F and F′. The true difference be-

tween the short diameter and the long diameter of the earth's orbit is in fact not great.

For most purposes the sun may be considered to be at the center. Yet, when it is considered that the sun is nearest to the earth on 2d January, it may be necessary to refer to Figure IV to illustrate the fact that all other points on the ellipse are farther away from the sun than the one on what is known as the major axis, where the earth is shown to be in the winter season.

THE RADIUS VECTOR

The straight line joining the center of the sun with the center of the earth, if the earth's orbit were a circle, would, of course, be the radius of the circle. In the case of an ellipse, this line bears the name radius vector. Except on the major axis, the radius vector is always longer than the radius of a circle.

THE SUN'S APPARENT SEMI-DIAMETER

Inasmuch as the sun and earth gradually separate, as the earth proceeds towards its Spring position, and thence to its Summer position, it is clear that the sun's apparent semi-diameter must constantly decrease until mid-Summer, and then steadily increase until it arrives at mid-Winter again.

The sun's greatest apparent semi-diameter, about January 2nd, is 16′ 17.88″. And its least apparent semi-diameter, about July 4th, is 15′ 45.70″, as shown by the Almanac.

Of course the Almanac shows the steady increase or decrease of the sun's semi-diameter, but it seems to add one more guard against mistake, if the mind also knows the reason and would be shocked by an error which manifestly pointed the wrong way and which might otherwise be overlooked.

THE VARYING SPEED OF THE EARTH ON ITS ORBIT

In orbital motion, the rule is that the speed of the body revolving about the central body is such that the radius vector sweeps over equal areas in equal times. When the earth and the sun are near each other, the earth has to progress a considerable distance to permit the radius vector to cover a space which would be equal to that covered by going only a short distance when further away. Consequently the earth moves more quickly on its orbit when it is nearer the sun. This would be apparent also if one considered the attraction of gravitation, which acts much more strongly as the bodies approach each other.

It seems quite natural, for example, that a comet coming toward the sun should increase its speed tremendously and after rounding the sun and getting some distance away should reduce its motion, and in this respect, the earth only differs from a comet with elliptical orbit by having an orbit more nearly circular.

The variation of the earth in its speed on its orbit has an effect upon the time of the passing of the sun over the meridian of any given point on the earth's surface. For each day, not only does the earth make a complete revolution on its axis, but there must be added a few minutes to permit the earth to turn a little further than a complete revolution by reason of the fact that it has progressed forward on its orbit. If in a single day it could progress one-quarter way around the orbit, it would take one revolution and a quarter to bring the sun overhead a second time.

When the earth is moving less rapidly, the sun comes more quickly to the meridian, and when it is moving more rapidly, the sun is delayed by reason of that fact.

The time required by the earth to cover the distance from the winter end of the major axis to the summer end is in fact equal to the time of the other half of its journey from the summer end of the major axis to the winter end.

Beginning at the winter end of the major axis, about 2nd January, and remembering that the earth is moving at its highest speed in the orbit, it will be noted that the sun will come again to the meridian of any given place a little more slowly than the average or mean day, as the earth must turn a little further than it would at a time of the year when its orbit speed was less. On the next day and the following days up to the Spring equinox, there would be added daily a few seconds of delay until the accumulated seconds would at the equinox show the sun some minutes behind a schedule based on the average length of day. From the equinox on, the motion of the earth would become continuously slower to about 2nd July, and each day the earth would have less of an additional revolution to make, to bring the sun on the meridian, and consequently day by day there would be gained the seconds lost in the first three months, until the sun would have caught up with the schedule based on a mean day. From 2nd July it would gain additional seconds daily and so run ahead of the mean day until at the Autumn equinox it would be as much ahead of the schedule based on the mean day as it was behind at the Spring equinox, and then with the increased speed of the earth in its orbit, it would begin to lose again, until at the end of the year it would again agree with the mean schedule.

This tendency of the sun to be behind the mean schedule for the first half of the year, with a maximum lag at the Spring equinox, and for the second half of the year to be in advance of the schedule, with a maximum advance at the Autumn equinox, is greatly modified by the inclination of the earth's pole to the orbit.

This inclination does not affect the problem at all at the equinoxes or the solstices, but midway between each of these four points, the effect reaches a maximum.

In mid February and November, the effect, in producing lag and advance, is like in kind to the effect produced by the earth's varying speed in its orbit, so that the effects are cumulative, and the difference between mean and apparent time is a little more or less than fifteen minutes. In the other quadrants the effect of the inclination of the pole is contrary to that first mentioned and being a little more pronounced, actually changes the situation so that in mid May the sun is ahead of its schedule about four minutes, and about 27th July it is over six minutes behind a mean schedule.

The result of these two influences is illustrated by the curve in diagram Figure V, which is platted from the Almanac.

The four times in the year when the sun is neither ahead nor behind mean time are about 14th April, 14th June, 1st September and 25th December, with maximum differences 2nd November and 11th February.

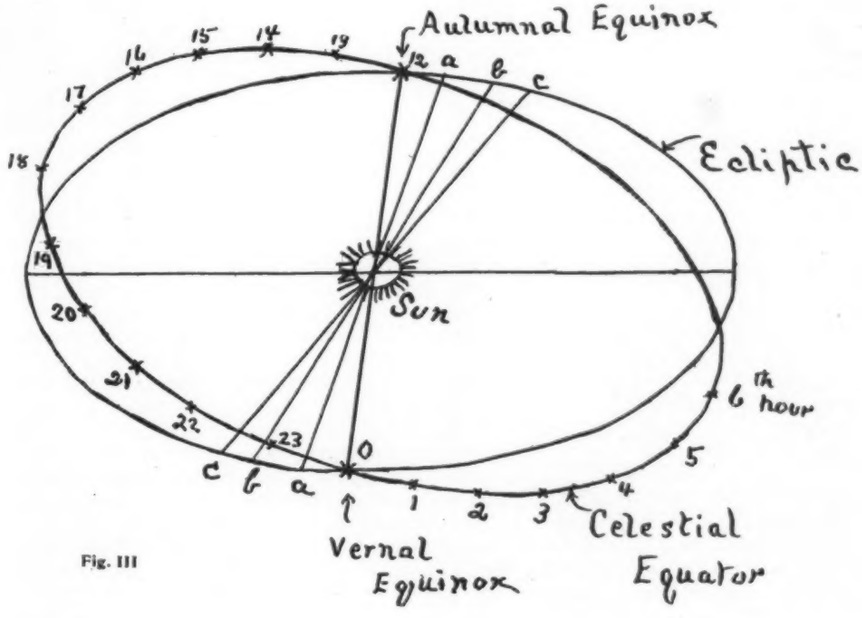


Fig. III

THE SOLAR DAY LONGER THAN THE SIDEREAL DAY, AND THE REASON

If the orbit of the earth were a circle with the sun at its center, and if the pole of the earth were perpendicular to the orbit, all days would be of equal length and each of them would result from a complete revolution of the earth on its axis, plus a small additional part of a revolution, to compensate for the forward motion of the earth on its orbit. These additions are unequal, owing to the varying speed of the earth on its orbit, but their sum total in a year equals one revolution of the earth.

In other words, if the earth always presented the same face to the sun, as the moon in fact does to the earth, in completing its orbit it would turn once on its axis, as viewed from some outside point in space, and yet the sun would not have made its apparent circuit of the earth nor would it have counted as a day.

It is this single uncounted revolution of the earth which is divided up among the days of the year and makes the solar day longer than the sidereal day.

The sidereal day or the apparent motion of the stars is produced by a true revolution of the earth. As the daily revolution of the earth is always unchanging in its speed, the stars come to the meridian always after an equal interval. And by reason of the fact that it is always a single exact revolution of the earth which produces this effect, each star day is a little shorter than any solar day. On the average the difference is a little less than four minutes, and the aggregate of these differences are just equivalent to the time of one revolution of the earth on its axis.

In other words, the revolution which does not produce a solar day is found in the star or sidereal day. One effect of this is that beginning with the 23rd of March the two days are together, and thereafter the star time gains approximately four minutes daily on the mean solar day, or approximately two hours a month, through the remainder of the year until the succeeding 23rd of March, when the full additional day has been rounded out.

With this in mind it is not very difficult to estimate approximately what the difference in hours is between the mean day and the sidereal day in any part of the year. For example, six months after the 23rd of March the star day would be exactly twelve hours ahead of the mean solar day. From then on there would be added to the lead of the star day not only twelve hours but the additional hours figured at the above mentioned rate of approximately two hours a month, or nearly four minutes per day, through the remainder of the year to the following March 23rd.

POLE OF THE EARTH'S ORBIT

If a perpendicular is drawn through the center of the earth's orbit, it becomes the pole of the orbit. In the sky that point is somewhat in the direction of the star Vega from the North Pole. Or it may be said that the pole of the orbit is about 23½° away from the pole of the earth, and on the meridian having a right ascension of 18 hours. Or, to put it the other way, and remembering the extreme distances of the stars, which make the whole of the earth's orbit a point, the north pole of the earth is 23½° away from the pole of the orbit, and in the direction of the January position of the earth.

So far as the stars are concerned, the sun may be deemed to be at the center of the orbit.

POSITION OF STARS AND CELESTIAL EQUATOR

Reference again to Figure I will show that in the Spring position of the earth, stars that lie out beyond its autumn position will be in line with the sun, or else above or below it, but upon the same meridian.

On the 21st of March the apparent sun coincides for the moment with those stars which have a zero right ascension, and on the 23rd of March the position of the mean sun coincides with those stars, which is equivalent to saying that the sidereal time of the mean sun is zero.

In order to hold the matter clearly in mind, the student must not let go of the idea that the stars are, so far as navigation is concerned, absolutely fixed in space. And while on the diagram the declination of them, that is to say their distance north or south of the celestial equator, cannot be shown, Figure VI shows approximately the position in right ascension which they occupy, subject to the slight annual change.

The location of the stars in the heavens is usually made with reference to the celestial equator, which may be described as the circle, indefinitely great, in which the plane of the earth's equator cuts the heavens. Stars that lie between it and the North Pole, are said to have a northerly declination measured from the celestial equator at right angles, in degrees, etc., of arc. The particular meridian on which they lie is determined from an agreed point on the celestial equator. This point could have been fixed once for all at any part of the circle, but as a matter of fact it was long ago settled to be one of the two points in which the circle of the ecliptic intersects the circle of the celestial equator, and of these two points, that one which the sun apparently occupies at the time of the Spring equinox. From this point the measurement to any given meridian is made along the celestial equator in the direction of the motion of the earth in its orbit, either in degrees of arc or in hours of time. Each

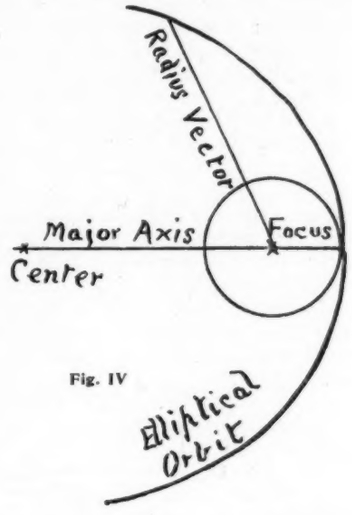
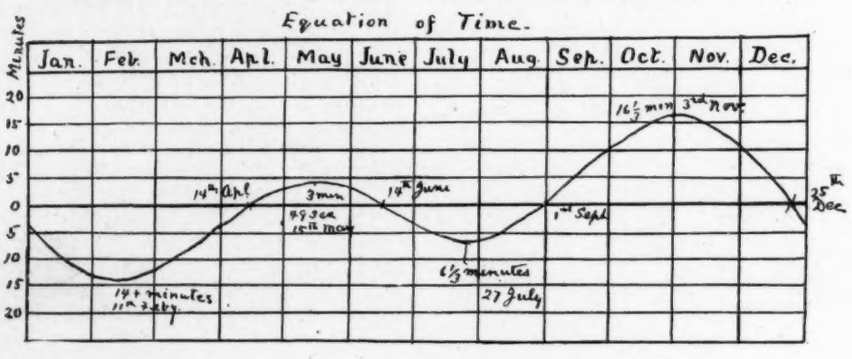


Fig. IV

fifteen degrees of arc corresponds to an hour of time, and likewise each fifteen minutes or seconds of arc correspond to one minute or second of time. These measurements in hours are indicated in Figure VI. The daily revolution of the earth on its axis brings these meridians successively overhead in the order of their numbering.

It must not be forgotten, however, that the figures do not belong to the earth's orbit and are not even in the plane of the orbit. They only indicate approximately the positions which the figures would occupy if it were practicable to draw the infinite circle of the celestial equator, which would be at an angle of approximately 23½° to the orbit and would attain its maximum dip downward i. e. below the plane of the diagram, at the winter or January end of the orbit, and a corresponding dip upward as it were, above the plane of the diagram, at the summer or July end of the orbit.

Fig. V. Note that the lower part of diagram shows sun as behind the mean time



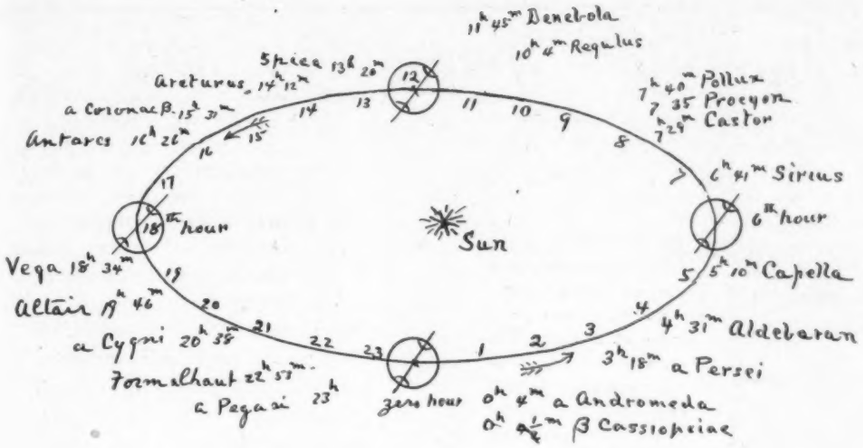


Fig. VI. The numbers are of right ascension

This is illustrated in Figure III and it is to be noted that the equatorial plane is tilted, while the orbit plane retains the horizontal, the intent being to suggest to the mind that the orbit plane is to be retained as the base of reference in the mind and the other plane is shown in relation to it and in a sense subsidiary. It will only lead to confusion if the student at any time assumes the equatorial plane as horizontal, making it for the time take the place of the orbit.

Elaborate directions are given in books on navigation for discovering what stars are visible at different times of the year and at different hours of the day. These seem almost beyond the convenient memory of man to retain and apply.

As a matter of deduction from Figure III it ought never to be difficult mentally to determine approximately what stars are available for observation.

In the first place, the position of the earth on its orbit should at once be made apparent in the mind. A line from it to the sun and beyond to the opposite point in the orbit will give the approximate apparent position of the sun in right ascension. Extended in an opposite direction this same line will indicate the right ascension of the stars which will be overhead at midnight. Assuming the earth to be in the center of the orbit, which is admissible on account of the great distance of the stars, a line at right angles to this first one will show the right ascension of stars which will be rising and others which will be setting at midnight.

Stars which are two or four hours (as daylight may be longer or shorter) behind the sun, i. e. of less right ascension, (assuming for this purpose that right ascensions of 22 and 23 hours are less than those of 1 and 2 hours), will be useful before the sun rises, and stars that are 2 or 4 hours greater in right ascension, (assuming for this purpose that if the sun is in 22 or 23 hours right ascension that 1 and 2 hours are to be considered greater), will be available for sights at sunset.

An examination of the diagram ought to make it apparent why this is so, and should save the falling back upon the memory for the application of a rule, the ground of which has been forgotten.

It is also possible to speed up a common watch so that it will gain 3 min. 56.6 sec. of mean time in each mean day. It can then be set by Greenwich Mean Time as of 22nd March, by use of the Table on page 2 of the Almanac, and it will then indicate the hour angle of the 1st of Aries, or zero hour of sidereal time, if due allowance is made for the approximate longitude of the ship,—and if due consideration is given to the question of whether 12 hours should be added to the watch hour, in other words, whether one o'clock is not actually thirteen hours, etc., e. g. on 21st September, at one hour after noon, the watch will approximately indicate one o'clock, which should be read 13th sidereal hour. If the longitude is one hour west of Greenwich, the allowance will make it the 12th sidereal hour. In other words the stars of 12 hours right ascension will be overhead.

Although the stars, so far as concerns the navigator, are absolutely fixed in space, the above mentioned point of reference, the Spring equinox, as already stated, moves westward on the ecliptic some fifty seconds of arc each year. This has the effect of altering the right ascensions of all the stars, so that, except for those that are backed over from zero into 23 hours+, the right ascensions are reduced each year. It has the effect in a slight degree also of changing the declinations of the stars.

In view of the fact that the stars have no semi-diameter and no equation of time and vary so little in declination and right ascension, in any given year, the working of an observation is reduced to a minimum. As already stated, there are some fifty-five of them, the apparent places of which are given for each month in the year, and the difference in right ascensions of which in the year differ only in seconds. They follow each other through the twenty-four hours at frequent intervals, and are, in the main, stars of the first or second magnitude. In fact only one of them is of the third magnitude.

The Almanac has a star map which gives a clue to the position of all these stars. But perhaps the most satisfactory small star map is contained in the Uranography, published by Ginn & Co., a book some five by seven inches and containing 30 or 40 pages of description of the constellations, with several pages of star maps, the cost of the whole being only thirty cents. The pamphlet is frequently bound in as a part of the "Elements of Astronomy," by Prof. Young of Princeton, a comparatively small astronomy and one which cannot be too highly recommended, if the student cares to embark upon the general subject.

With regard to the identification of stars by the eye, it may be said that this is not a matter of a day or a week nor a year, but the slow accumulation of experience, and in general consists in a recollection of more or less geometrical figures. Nearly every one knows the "Great Dipper," for example. With a sweep of the curved line of its handle, about equal in length to the length of the handle, one arrives at a brilliant star "Arcturus." Continuing the curve and the sweep, a bright star "Spica" is encountered. In summer evenings, in the latitude of New York, the star "Vega" is over head and a little toward the east is the cross in "The Swan," which a little effort will pick out. Below the Cross is "Altair" on each side of which are two small stars which, when learned, mark it as distinct from everything else in the heavens. In October and November, overhead in the early evening is the great square of Pegasus, with a line of brilliant stars running off northeasterly from one corner, and a little triangle of stars in another corner. Once well acquainted with it, it could hardly be mistaken. Cassiopeia, making a crude "W" or "M" according to its position in the heavens, with its five notable stars, is also unmistakable when it is once known. Its leading star as well as the two easterly stars of the great square of Pegasus lie close to the zero right ascension, and acquire some interest by reason of that fact. The inner two stars of the bowl of the Great Dipper are close to the 12 hour of right ascension, and as one or the other of these constellations is generally visible, one may get an impression of the approximate star time merely by an inspection of the heavens and a slight calculation of the angle which these stars make to the meridian.

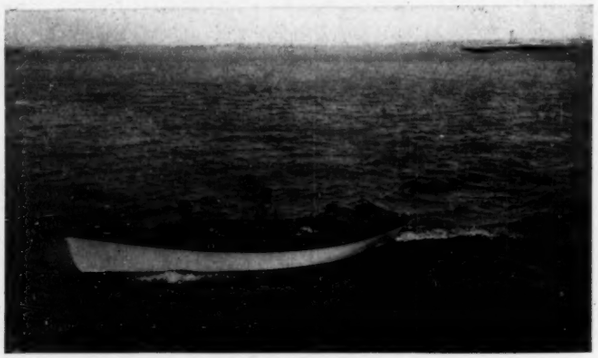
THE MOON

In addition to the sun and the stars, the moon used to furnish an object for observation, particularly for longitudes. Captain Leckie in his "Wrinkles" gives the reasons for dismissing the moon as a practical aid to navigation, and the dropping of much of the detail respecting it from the Nautical

(Continued on page 115)

D O R I E S

CYRUS WILSON



EVERYWHERE on the water one meets with the up-to-date motor dory. Sometimes in the guise of a rough and ready work boat, sometimes as a yacht tender, many, many times as the family runabout, and always jogging along at fair speed in rough or smooth water.

SOMETIMES I think the world, at sea at any rate, would be at a loss without the dory.

Developed as it has been by the fisherman of New England as a nest boat to carry in multiple aboard the smacks that hail from the ports of those hardy coasts, the dory is everything a small sea craft should be. It is buoyant, it is easily rowed, a fast traveller under sail, and has the ability to plug along with ease when carrying a heavy load of fish.

With these virtues is it any wonder that with the creating and perfecting of the small gasoline motor the dory has become one of the most popular of all small motor craft?

A genuine honest-to-goodness old-fashioned dory is a lightly and strongly built craft. The bottom, in an athwart ship direction, is quite flat and carries its greatest width at approximately the middle of the boat's length. Forward the bottom tapers sharply to take the stem, while its after end is squared to take the base of the stern board.

A slight rocker carries for-and-aft and usually the bottom is constructed of two stout planks, with a longitudinal seam running along the craft's center line. Widely spaced athwartship forms, or frames are erected across the bottom and upon these, which by the way are practically straight, are fitted wide side planks, usually three to a side. The banksmen's dory is open from end to end and fitted with removable rowing seats.

The installation of a motor in the dory soon demonstrated the fact that here was a splendid motor boat and by rounding its sides, thus creating greater width at the water line, the craft's stability was increased and its appearance improved. Decks added both at the bow, stern and each side, with a nicely fitted coaming, permanent side seats, and athwartship ones gave greater strength and more comfort while an inside steering gear, with a wheel forward and another beside the motor aft, made handling a simple matter.

To-day several boat-builders are specializing in the manufacture of both power and sailing dories, the better known of them being the Toppan Boat Mfg. Co., Geo. L. Chaisson, the Cape Cod Power Dory Company and Banfield and Son.

★

CLUB MEMBERS IN UNITED STATES GOVERNMENT SERVICE

LIEUT. HERBERT STONE
U. S. Naval Reserve Force

LIEUT. ROGER HADDOCK
U. S. Naval Reserve Force (constructor)

LIEUT. M. S. BENTHAM
U. S. Naval Reserve Force

CORNELIUS SHIELDS
U. S. Naval Reserve Force

MILTON LOWEY
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LIEUT. COMD. DANIEL BACON
U. S. Naval Reserve Force

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CAPT. SAM GARGES
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Ordnance Dept., U. S. Reserve Force

DR. C. W. HENDRICKSON
In France

DR. J. S. WHITE

CAPT. WM. GREFF
Frankfort Arsenal

ARTHUR DEALY

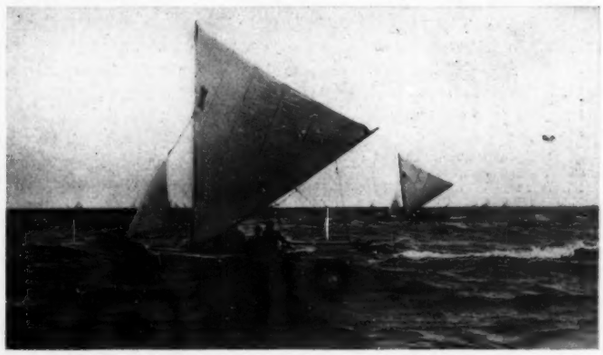
GEORGE S. RUNK

A. WALLACE JONES
In British Service

The Roll of Honor of The New Rochelle Yacht Club, New Rochelle, N. Y.

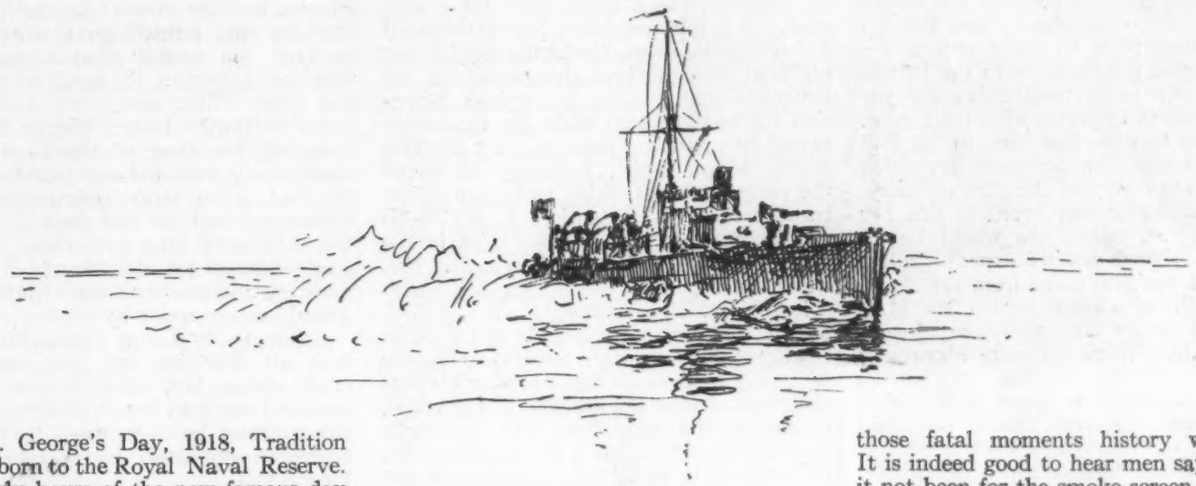
THOUSANDS of sailing dories are enrolled in the yacht clubs as one design racing boats. Fast sailers they are, thus offering a maximum of sport at a minimum outlay of money, for few craft are less expensive to build.

It is perhaps safe to say that the dory is the craft of the multitude.



One Hundred Minutes at Zeebrugge

By LIEUT. GORDON S. MAXWELL, R. N. V. R.



THE M. L.s, 550 of them, were designed and built for the British Admiralty by the Elco Works of Bayonne, N. J. These miniature men-o'-war—they are but 85 feet long—have a speed of about 21 miles an hour and are powered with a pair of 6 cylinder Standard motors.

ON St. George's Day, 1918, Tradition was born to the Royal Naval Reserve. In the early hours of the now famous day the R. N. V. R., represented by a flotilla of motor launches, played an important part in a Naval engagement that thrilled the nations.

Of the action in general I do not propose to deal, save as far as concerns the M.L.s., for the former has already been described; but of the experience of the particular part played by the R. N. V. R. this, I think, is the first account to appear.

The worst part of the whole affair was perhaps the waiting—the anticipation of the unknown. Before the action we had two abortive starts, both of which failed to materialise on account of the weather conditions. The ten days that elapsed were trying to the nerves, and we were glad when we had orders to leave harbour. Word quickly circulated that it was to be the real thing this time. The M.L.s. made a fine showing as they left Dover Harbour and formed up ahead. At "A" position, where the other forces joined us, we started in earnest. The destroyer Warwick with Vice-Admiral Keyes on board led, Vindictive came next with Iris and Daffodil in tow. Then came the blockships, Thetis, Intrepid, Iphigenia, Brilliant and Sirius. On each beam of the line were the M.L.s. and, outside, the destroyers. It was an imposing sight in the twilight. Vindictive seemed to loom up above everything else; she was a weird looking craft with no mast, tall funnels and boarding gangways swung up high upon her port side.

At "D" position Brilliant and Sirius left us for Ostend, while we continued our way to Zeebrugge, each ship going to its appointed station for the attack. As we neared our objective the Huns learned of our approach by aeroplane. Star shells began to go up. They were wonderful star shells, and lit up the sea like day. The last I saw of Vindictive that night was when the first star shell soared above her. There she was, like some grim phantom ship ploughing her way towards the dim outline of the Mole (our smoke screen had already begun), while close behind rounded the squat looking Iris and Daffodil, with all surrounded by M.L.s and C.M.B.s.

The smoke began to thicken, till finally it blotted out everything in its fumes. Still, the relief when one of those brilliant star shells hit the water and went out was great, for while their light was shining it seemed that every ship approaching the enemy harbour must be an easy mark for the batteries, and it gave one a very "naked" feeling. Thicker and thicker grew the smoke as more floats were dropped. All sight of the Mole and the happenings on and inside it were blotted out from our sight if not from our ears, for we could still hear the guns' incessant roar and the greater single roar that seemed to rend the very night as the old submarine blew herself up to destroy the viaduct connecting the Mole with the shore.

The action, from the attack on the Mole by Vindictive to the retirement, lasted exactly *One Hundred Minutes*. During those fatal moments history was made. It is indeed good to hear men say that had it not been for the smoke screen put up by the M.L.s and C.M.B.s and the rescue work of the former, the action could never have succeeded; in fact, could not have been attempted. In this the R.N. have acknowledged our part like sportsmen, and the R.N.V.R. are proud to have had the chance of proving themselves blood brothers to the R.N. One remark, overheard in the Burlington Hotel at Dover, shows how a new feeling towards us has been born. A group of R.N. officers, some from the blockships and some not, were overheard discussing the part played by the M.L.s., and one said: "Well, if I ever hear anyone call them Harry Tate's Navy after this, I'll punch his damned head." And the rest answered in chorus. A casual incident, but one with much behind it. Not that we mind banter, for you will hear more jokes at the expense of M.L.s. on board M.L.s. than anywhere else—thank God for a sense of humour.

I am saying little about the part played by the "Hush Boats" (C.M.B.s.), not because their work was not as good as ours (in many ways it was far more wonderful, for, although they have double our speed, they are only half our length and practically open boats), but because I think it better that someone who was on one of the marvellous little boats should write up the "stunt" from their point of view. Their personnel is, of course, a mixture of R.N., R.N.R., and R.N.V.R.

The first two M.L.s. to get inside the Mole were those of Lieut. H. A. Littleton and Lieut. P. T. Deane, and these two boats constitute the keystone of what credit is due to the M.L.s. for their share in the action. The first of the blockships to enter was Thetis. Close on her quarter was an M.L. Next came Intrepid, with another M.L., and Iphigenia close behind. Of the other M.L.s. that were

designed to enter the enemy harbour one was that of Lieut.-Commander Young, which was sunk before she got in, and one which had engine trouble and could not reach the entrance in time.

A very brisk fire was opened on the ships as they came round the end of the Mole through the gap between the barges and the boom to the shore. But the old cruisers plunged on to their objective—the blocking of the entrance to the Bruges Canal—at the same time answering the fire of the shore batteries with their guns. Then Thetis had the bad luck to fall foul of the net boom with her propeller, which left her at the mercy of the guns on shore, so her Commander was forced to sink her where she was, where she would be an obstruction, though not in the spot intended. Heedless of the heavy fire from the shore, Lieut. Littleton closed her in his M.L. and picked up the crew who were already in the boats. When all were aboard he turned to leave the harbour, but just as he did so a shout was heard from behind and some one cried out that a boat-load was coming up from one of the other ships. A begrimed and hatless figure in a duffel coat said, "Do you mind waiting a moment, I think there are some more men coming"?

Littleton's answer surprised the Captain: "You priceless old thing, of course I won't wait for them."

The Captain stared.

"I'll go back for them," added the "Doctor," and right back into that inferno of fire he took his M.L., got the crew aboard and turned once more to clear harbour, but stopped yet again to pick up a man who had fallen in the water. With a surplus crew of 60 odd, the M.L. found her way outside the Mole amidst the smoke and trail of shells, to arrive finally at Dover without mishap save for a machine gun bullet through her after hatch, and a piece of shrapnel through the roof of her bridge house—a wonderful achievement and a wonderful escape.

To the number one, Lieut. Lefron Geddes, praise is due for his untiring efforts throughout the whole affair, and for seconding his skipper in the rescues and in the running of the ship under heavy fire, and bringing it safely out of the danger zone, while Lieut. Littleton was doing his best to make the wounded comfortable with the limited accommodation a motor launch affords.

The rumour that the "Doctor" put on a clean collar in the middle of the action because the "damned smoke" had soiled the one he was wearing is, I believe, unfounded, but it is at least characteristic of Lieut. Littleton. He told me afterwards that he had no idea that the dishevelled figure was a hatless "brass-hat." He thought he was an A.B. I wonder how he would have looked under normal conditions on being called a "priceless old thing" by a two-striper R.N.V.R.?

Meanwhile Intrepid and Iphigenia were making their way into the mouth of the Bruges Canal, followed by Lieut. Deane in his M.L. His achievement was possibly the most remarkable of any M.L. throughout the action, for he was instrumental in saving over a hundred men from Intrepid and Iphigenia. Curiously enough they managed to get inside the Mole with hardly a shot being fired at them, by using one of the blockships as a screen from the enemy guns. Still following close behind Intrepid and Iphigenia, Lieut. Deane managed to get his boat straight into the mouth of the Bruges Canal, where he waited alongside the western arm while the blockships swung into position, putting up an effective smoke screen which certainly hampered the shore batteries which had by this time transferred their attention from Thetis and were submitting the two ships in the mouth of the canal to a devastating fire. After the explosion which sank the blockships, Lieut. Deane closed them and took off the crew who were already in the boats casting off. These he got aboard, and he was just going to leave the harbour when his boat grounded on the sloping side of the canal, damaging the propellers. At the same moment he discovered a Carley float with one man on it, so he went ahead again and took off the occupant, which happened to be the Captain of Intrepid. So intense was the fire all around that the M.L. was forced to back out to save time, and, as this had to be done with damaged propellers, it was certainly a wonderful piece of work, laden as the launch was. It must be remembered that all the while brilliant star shells made the scene as light as day.

During the manœuvre three men on the launch were killed, including the coxswain at the wheel. Slowly the C.O. brought his vessel round the stern of Thetis, where he managed to turn her and commence the perilous passage out of the harbour, passing the gap in the Mole, now clearly visible by the light of the star shells. It says much for the coolness and resource of Lieut. Deane that he conceived the daring plan of running his boat close along the Mole wall, thus rendering ineffective many of the larger German guns which could not be depressed sufficiently to bear upon him, although of course the manœuvre did not prevent the heavy machine gun fire being directed on his boat.

But just as the M.L. was clearing the harbour, in fact, as she was passing the last of the anchored barges which marked the entrance, a shell from the shore batteries burst over the dinghy and killed several men, and carried the deck pump away, while another hit the forecastle, killing three men and wounding several others.

It is certainly a little less than a miracle that the boat managed to get to the open sea at all, for at this point the steering gear jammed, owing to somebody's coat getting entangled in the wire, and several valuable minutes elapsed at this vitally critical juncture before the cause could be discovered and the wires cleared, during which time the boat had to be steered by the engines alone.

The behaviour of the Number One, Lieut. Keith Wright, throughout the action deserves the highest praise. Soon after the shell that killed the coxswain had hit the boat, the C.O. sent a message to him from the bridge and received a reply as though nothing had happened. Just as they were clearing harbour he sent again to him, saying that he was wanted on the bridge, but received the answer that Lieut. Wright was busy attending the wounded and could not come. Ever since they had left the Canal entrance Lieut. Wright had been lying on the floor of the Chart House, dangerously wounded and unable to move. He had given strict instructions to the messengers that this fact must be kept from the C.O. until they were clear, in case it might distract his attention from his work and thus add another danger to the boat, so already encompassed by perils.

Subsequently Lieut. Deane managed to pick up Warwick and put the rescued crews aboard her, except one or two dead men and one man too seriously wounded to swim, whom he took direct to Deal Pier, where an ambulance had been summoned by wireless.

That an M.L., whose full complement is ten men all told, should have been able to get out of harbour with over a hundred men on board, at night, would have been wonderful under peace-time conditions, but when we consider that the feat was performed amidst a tornado of gun fire, some idea of the achievement can be imagined, for by the time the Vindictive was clear of the Mole all the attention of the enemy was directed on the M.L.

The first R.N.V.R. officer to be killed was the Senior M.L. Officer in the action, Lieut.-Commander Dawbarn Young, who was in command of the first M.L. to approach the Mole with the purpose of laying flares to guide the blockships in. This he was never destined to do, for when he was yet four hundred yards away his bridge was struck with three shells from a shore battery, killing the coxswain instantly and severely wounding Lieut.-Commander Young, Lieut. Lee and members of the crew. Although mortally wounded he stuck to his post and gave orders for the dinghy to be lowered. Lieut. G. F. Bowen, the first Lieutenant of the ship, had perhaps what was one of the most marvellous escapes of the night; although standing on the bridge close to his C.O. and Lieut. Lee, he escaped without a scratch. Great credit is due to Lieut. Bowen for his coolness at this time, for with the M.L. still under heavy fire, with the help of the unwounded members of the crew he launched the dinghy and managed to get his C.O., who had now collapsed on the deck, into it. When all the rest were aboard, he wrenched off the ship's compass, passed it over, and from the Lewis gun emptied two trays into the already holed hull of the M.L., at the same time smashing her in several places under the water line with an axe, not leaving her until she was settling down by the head. The plight of

nine men, many of whom were wounded, in a little tin dinghy in such an inferno could hardly be worse, but they stuck gamely to it. Lieut. Bowen and the chief motor mechanic were the only men in a fit state to row; all the rest were either badly wounded or prostrated with shock.

The circumstances in which Lieut. Lee happened to be on board this M.L. are interesting. He had just arrived at Dover for the "stunt" to find to his disappointment that his boat was not ready to sail, owing to some important repairs being necessary. Rather than miss the action he obtained permission to go on Lieut.-Commander Young's M.L. as a spare officer. Even now, while they were in the dinghy, Lieut. Lee, though unable to row, refused to be a passenger in spite of his wounds, but held the compass between his knees and with his uninjured hand managed to work an electric torch and set the course.

For about half an hour they toiled on, heading away from the Mole with a strong easterly tide. Three C.M.B.s. dashed by, but were lost again in the darkness and smoke before they could hear the hails from the dinghies. Then an M.L., under Lieut. H. W. Adams, loomed up in the gloom and luckily heard the shouts.

Lieut.-Commander Young died on the way across. He was conscious till the last, and wonderfully plucky over his wounds. His left arm and right leg were badly hurt, but it was a gash in his left lung which proved fatal. His death will be a great loss to the R.N.V.R. in general and in particular to the Dover base, where he had been for over two years. Young was a "white man"; a mean or lying action was impossible to his nature, and no man ever set or kept a straighter course than he. A most efficient officer and a very hard worker, he expected others to be the same; but he would never ask a junior officer to do what he would not willingly do himself; in fact, he often did more work than he need have done in his position, a fact which all who served under him appreciated. I have often heard men say, "You'll always get a straight deal from Young," and it was true. He was the essence of fairness in all his dealings. What finer epitaph could he have than this:—"We sincerely mourn the loss of a true friend and a very gallant comrade, who died, as he would have wished, at his post of duty."

Lieut. Oswald Robinson was the second M.L. officer to be killed. The circumstances were unsimilar to those connected with the death of Lieut.-Commander Young. His boat was hit while off the Mole, and again it was the bridge that was struck, the shell killing the C.O. and the Coxswain instantly. Lieut. Robinson's body was never recovered; it must have been blown away. Another incident that was almost the same as that experienced on the first boat to go: Number One, in this case Lieut. J. W. Robinson, was on the bridge at the time the M.L. was hit, but came off unscathed. The dinghy was launched, but before it could be manned, another M.L., under Lieut. R. Saunders, camp up from out of the smoke and took them off. Lieut. Oswald Robinson will be missed by all and his cheery personality is a great loss to our little fleet. Only a few days before the action he was one of the principal performers in a concert we got up in the wardroom of Arrogant. He was a wonderfully clever mimic and actor, and his impersonations were the feature of the concert. To his young wife our sympathy goes out very fully and very sincerely.

Some of the M.L.s. had remarkable escapes. One of the narrowest was that of the boat under Lieut.-Commander L. S. Chappell, on which the Flag-Captain, Captain R. Collins, R. N., who was in command of the Motor Launch Flotilla, hoisted his flag. Throughout the hottest part of the action Lieut-Commander Chappell kept his boat right off the Mole, on the beam of Vindictive, to screen, as much as possible, the latter vessel with his smoke. Every now and then when they came to the end of their short patrol the smoke blew away, exposing them to the full glare of the searchlights from the Mole. The only escape was to turn sixteen points into their own smoke and make their way back and renew the manœuvre. This the M.L. kept up during the time that the storming party from the Vindictive landed on the Mole, and it undoubtedly saved them from much of the fire from the western shore batteries. It was Captain Collins himself who hailed the blockships during the early part of the action and directed them to the entrance of the enemy harbour, after Lieut.-Commander Young's boat had been sunk, whose duty this was originally. It was during one of the exposed moments that I have mentioned that Lieut.-Commander Chappell's boat had its miraculous escape. A 6-inch shell landed on their magazine hatch, ricohetted on to a box of six-pounder ammunition and blew up the latter without, however, exploding every shell. The iron top of the hatch was blown clean away, but fortunately the explosion expended itself upwards instead of downwards, otherwise nothing could have saved the ship. Some of the cordite from the six-pounder shells exploded in mid-air after the shells had been blown to pieces in a very curious way, for the force of the explosion really burst the shells instead of detonating them in the usual way. The only real damage it did was to set the foredeck on fire, but once again the magazine was saved by the quick action of the Number One, Lieut. C. C. Calvin, who extinguished the flames very promptly with pyrene.

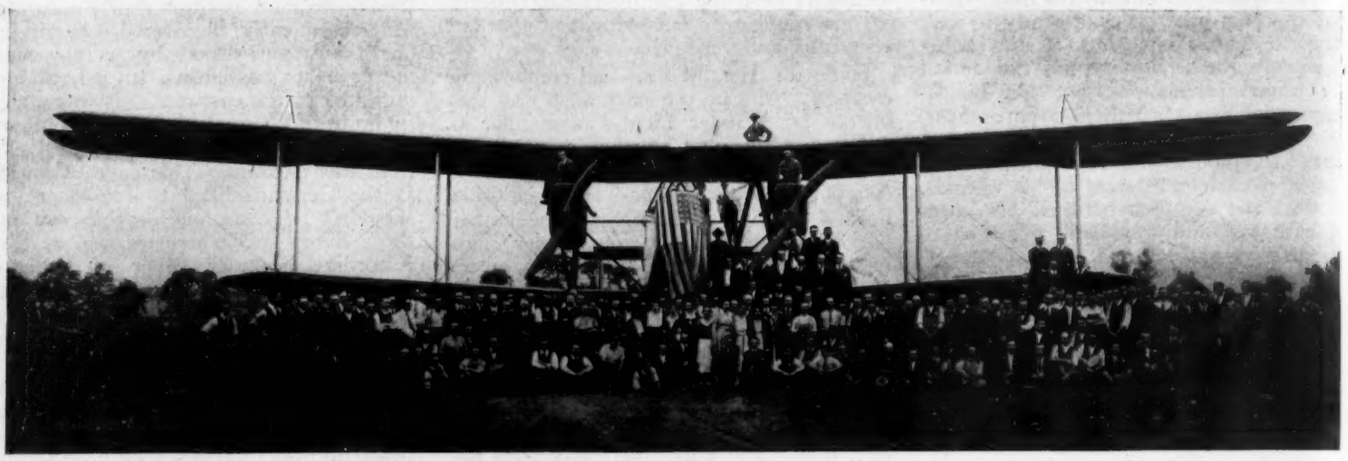
There were other narrow escapes on M.L.s. that night; for instance, on one a shell fell into the engine room, but did not explode. But it is not possible to narrate every story, or to pretend that this account is that of an eye-witness, the dense artificial fog, or smoke, in which the action took place would render such impossible. All I have told is from accounts of the actua participants. As regards the eye-witness point of view, I can speak only of what happened on my own M.L. Perhaps I am justified in telling the story.

We were the most westerly boat of unit "G," whose duty it was to find No. 4 buoy previously laid down by a Coastal Motor Boat. This in the darkness, we failed to pick up, so when we considered we were in the approximate position (fairly accurately, we subsequently discovered) we dropped our buoy, and stood by as the smoke patrol boats passed us, turned, and disappeared to the eastward. It was a signal for a fresh shower of shrapnel and pom-pom shells around us, a good deal closer than was pleasant. This gave us an idea. If the Germans liked to fire at us, why shouldn't they, as long as the position of those buoys was where *we* wanted them? Accordingly, under cover of the thick pungent smoke, we steamed northwards for a minute and then westward at full speed for two miles, and then, more cautiously, we made our way in-shore. We must have been about five hundred yards or so away, for by the light of the star shells over Zeebrugge we could see the beach and the sandhills plainly. All at once the beams of a powerful searchlight blazed out from the shore and swept about us. At first we were not located, but after a moment they picked us up and then the batteries opened up. A buoy was dropped at once and managed to dodge the beams of the searchlight behind the thick smoke that poured off. We drew off about a quarter of a mile, but the batteries still continued blazing away at the buoy and the searchlight was trying to pierce the smoke to discover what was behind the flare. We dropped a second buoy, and about a quarter of a mile further on let go to a third. All these sent up the same bright flare, and a perfect fusillade from the western shore batteries was poured forth at them. We were out to sea again, and as no shots came near us, we waited to note the effect of our little ruse. It certainly seemed to be answering, for we undoubtedly had the Hun guessing. Those lights so close in shore, away from the main operation, evidently puzzled him; possibly he imagined that something in the nature of a landing was being attempted, but whatever he thought, he certainly wasted a lot of ammunition on nothing, which meant the less for Vindictive alongside the Mole.

It appealed to our sense of humour to think that one solitary little M.L., a couple of miles away from its friends and relations, could put the "wind up" the Hun to that extent. Had we not been getting short of buoys and in need of what we had left for our correct position, we should have been tempted to repeat the experiment, but we steamed back to our original place in the line and carried on smoking till the time for the retirement. But we had nothing

(Continued on page 112)

LANGLEY, CRUISER OF THE SKIES



I

I

WHEN the late James Gordon Bennett built the steam yacht *Lysistrata,* a 301 foot craft, she was the largest American owned yacht and incidentally, one of the most expensive. The niche held by this famous yacht is filled, in the land division of America's air forces, by the *Langley,* a giant airplane of Handley Page design.

The *Langley* is the first air craft of this type built in the United States and is the forerunner of hundreds upon hundreds of other similar ones now under various stages of construction.

Some one hit upon the glad idea of christening this giant bombing-plane—christening it just as every yacht and ship are christened. As this great Liberty-motor-powered craft slipped from its hangar, so to speak, unfolded its 100 feet of wing spread, and trundled its 9000 pounds of dead weight before the launching platform erected on the broad flying field of the Standard Aircraft Corporation at Elizabeth, N. J., by whom the great aircraft was built and before thousands of interested spectators and hundreds of guests Mrs. Harry Bowers Mingle, wife of the chief executive of all its constructors, wished it well and named it *Langley* as a splash of wine wetted the nacelle, —Langley, in honor of the father of the heavier than air machine, the man whose life work laid the ground work upon which present day airplane designers base every calculation. Folks laughed at Prof. Samuel P. Langley less than 30 years ago because he *knew* men could fly. And because the essentially correct man-carrying machine he designed and built was wrecked through a faulty method of launching, wiseacres of his day laughed again at the visionary who dreamed of a successful "Darius Green."

II

AMONG the prominent men at the christening of the giant air cruiser *Langley* was Allen R. Hawley, President of the Aero Club of America, and Harry Bowers Mingle, President of the concern which built it.

II

III

JUST as a ship or yacht has an official launching so had the air craft *Langley*. Amid the applause of hundreds of guests Mrs. Harry Bowers Mingle, wife of the President of the Standard Aircraft Corporation, christened with American wine this huge bombing plane and bestowed upon it the honored name of *Langley*.

IV

MEN who yacht, all sportsmen, are interested in flying. Many of them, unquestionably will join the legions who in the years to come after the war will navigate the skies—YACHTING therefore presents from time to time photographs of craft that as the years roll by will develop into marvels of speed, comfort and safety.

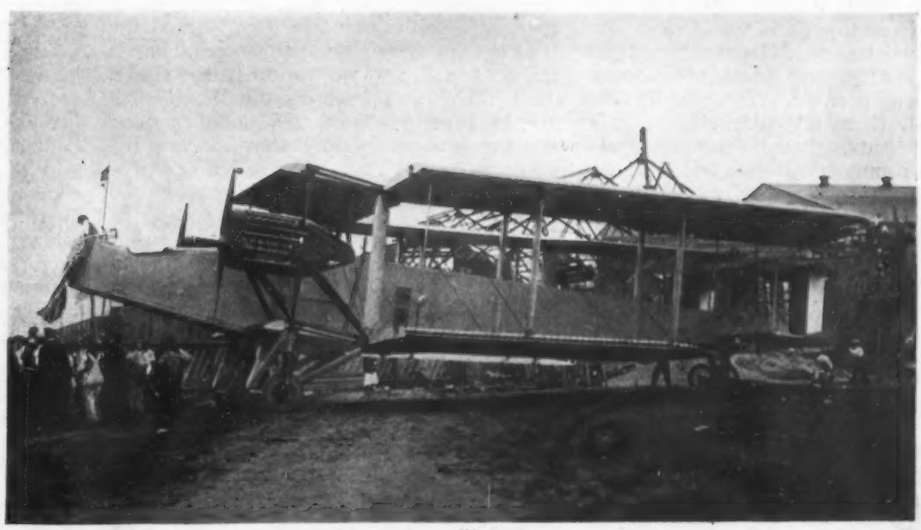
In the *Langley* which was completed some weeks ago at the Standard Aircraft Corporation's plant in Elizabeth, one gains an insight as to what the United States is beginning to produce as its share of the air craft sorely needed to help civilize *all* of the world.

Here is a big 9000 pound machine fitted with twin Liberty motors of 400 h. p. each. On its trial trip its speed proved to be 90 miles an hour and as sufficient fuel may be carried for a 600 mile flight and several thousand pounds of supplies, bombs and crew it is indeed a formidable and wonderful craft.

Measuring 100 feet from wing tip to wing tip and with a length of approximately 60 feet from nose to tail the problem of housing seemed a serious one—it however was overcome by hinging the great double wing surfaces in such a way that they may be quickly folded against the sides of the fusilage.

The Liberty motors are inclosed within armored compartments and suspended each side of the nacelle between the upper and lower planes.

Handley Page is one of the foremost English airplane designers and his genius backed by the productive methods of American manufacturers will, long before another year passes, place a formidable fleet of air craft to help our allies and us victoriously win the war.



IV

The Log of a Cruise in 1817

Being the Voyage of Thomas Dean Through the Inland Waterways of the Middle West

Continued from August YACHTING

JULY 11th. We started about 5 A. M. and ran up to the Cutoff or chute as it is called. This is a part of the river that cuts off a great bend and forms an island. To go around the bend would be seven miles and to go across is about two, so that the island was nine miles in circumference. We entered the chute and found a swift current, and very full of logs and trees, so that it was difficult getting along. However, we with great exertion rode through in one hour and forty minutes; went up one-half mile and crossed onto the Illinois side, took breakfast on the bank, and then went on. The wind being fair, but light, it helped us some; the current being strong, rising, and smooth. We ran up to Wilkenson's Ferry and took dinner of mush and milk. This is ten or twelve miles from where we started. Near this place we saw the first rocks or stones since we came on the Wabash, as big as birds' eggs. After dinner we went two or three miles and came to a rapid called the Grand Chain. This swift water, with some rocks in the bottom, we ran up without difficulty, then passed several bends in the river, which brought the wind ahead, though it was light, and the clouds gathered on every side as though it would rain very hard, and there was much hard thunder and lightning. We ran until a little after sunset and put up at a cabin. The people very properly call them all cabins, here, they being small huts, though this one was poorer than common. We supped on mush and milk and turned down on the floors, where we rested indifferently. The man told us we had come twenty miles this day.

July 12th. We started about sunrise and ran up the river against a strong current most of the way three miles to the Grand Cutoff, which is about two and one-half miles across and twelve or fifteen around the island. It was thought we could not get up with our boat through the chute; we landed at the point and went to reconnoitre. We went up to the rapids, about a quarter of a mile, while breakfast was preparing, and found strong rapids with rocky bottom. As bad as it appeared, we concluded to try, so we returned, took breakfast, and proceeded up to the rapids, which were very swift and very rocky. The water falls, by appearance, about six feet in eight or nine rods, and the rocks are large. We ran our boat up to the foot of the rapids, took out our chest, boxes and some other articles to lighten the boat, and carried them up to the head of the rapids. It is at this place that the Harmonists are building a famous grist mill. They have a fine quarry of stone that is easy hewn and would make grindstones. Their work appeared to be well done and their walls very thick and strong. Some of the inwalls were five or six feet square and the wall laid smooth. There were twenty or thirty hands at work at it, carpenters, stone cutters, and laborers. They were very friendly to us. We ran across to the right-hand side of the stream near where the mill was building. Thomas Dick, Isaac J. Dick and R. Fowler took hold of the bowfast; P. Dick and I were in the boat, Paul on the bow with a pole, and I steered. The current ran very swiftly and it was hard work to hold her by the fast, but some of the Harmonists took hold and assisted. We ran up by the worst rock, the fast broke, and we swung round in spite of what Paul and I could do, and went down sidewise over the rocks. Some of them were so near out of water that we thought the boat would overset, but we went down without much injury and then worked the boat over on the right shore, where all hands got on board, and we ran up to the chute. The Harmonists were on the beach with another rope to help us. We noted that our fast was bent at the small sternfast, and the other warped. Then, after much exertion, we went up the chute. They would take nothing for their assistance. We took in our goods and proceeded up the cutoff through a gentle current until we came to the main river, though it was full of logs, trees, etc. Then we went up three-quarters of a mile to the landing, opposite the town of Harmony, where we arrived all fatigued about 1 P. M. We landed and took dinner, went up to town and obtained some fresh supplies of provisions. It being near night, we concluded to put up for the night and to lay over the Sabbath, as we had not been at any place since we left home where we could improve to our satisfaction. Therefore we concluded to stay with the Harmonists, having procured lodging at their public house. Came about five miles.

July 13th. In the morning we prepared for meeting and went to their forenoon meeting. They had a very good meeting house and there were three or four hundred of the Harmonists assembled. They were the whole, with the exception of ourselves and two or three others. The minister, by the name of Rapp, delivered a discourse in the German tongue which we could not understand; they sang in the same language, and appeared very solemn and severe in their devotions. After meeting (half past 10 A. M.) we went to look at their fields, vineyards, etc.

July 14th. At about 3 A. M. the bell rang for duty and we prepared to start; got under way at half past 4 A. M., went up the river five or six miles, and took breakfast on the bank near a house or two. After breakfast we proceeded and in the course of the day took in some good water and passed up to an island. We wanted to run to the left of it, and got part of the way, where the bar across was so shoal that we thought best to run back and go around the island. In passing around we saw four or five wild turkeys on the island. They flew across to the right and were on the bank. Our company landed with guns, but got no chance of a shot at them. We proceeded on up the river until near 9 o'clock in the evening and took lodgings on the floor at a house on the bank. The current ran very swiftly. It was a hard day's work, though it is said we came but twenty miles, and we had the wind in our favor about three hours, and then a headwind. The banks of the river were not high and were subject to be overflown in high water, except where we put up. We saw fine pieces of cane on the shore, some of which we took on board before night.

July 15th. We started in the morning and ran up five or six miles, took breakfast on the beach, then proceeded on up the river ten or twelve miles and took dinner on the bank, then went up the river until dark. Not finding a house, we went on shore, made fast, and lodged in the boat. I was very much troubled with the cramp in consequence of swimming in the course of the day. We came eighteen or twenty miles and stayed within about two miles of Colkey Island, where there is some swift water.

July 16th. In the morning we ran up above the French settlement at Colkey

Island and took breakfast on the shore. We had a fine mess of mussels for breakfast and then passed on up the river until we came to the mouth of the White River about 4 P. M. This river is between 100 and 200 yards wide at its mouth and the water appeared deep, but understanding it was hard going up, we continued to go on up the Wabash to Fort Wayne, if possible, or we might lose our boat. So we continued up the Wabash and soon came to the Grand Rapids, where the water ran very swiftly and the bottom was a slippery rock. We had to get out and wade to find the channel, and shove the boat up. We passed up after dark and put up for the night.

July 17th. Started up another rapid, where we got out, pushed the boat up, passed a little creek, and came to a small village called Palmyra, on the Illinois side, where we obtained some good water and two fish; went on a little farther and cooked dinner. I was quite unwell in consequence of taking cold by being in the water. Paul Dick was also unwell, and Thomas Isaac likewise. We went up to a place called Dunkertown, about three miles from Palmyra, and put for the night. There was one poor house where we put up; there were one or two more houses not far off. We all took some lus pills.

July 18th. In the morning I was quite sick and the landlord was unwell. He invited me to go to see a small prairie not far off. I went with him. It was settled and cultivated; the land was very handsome and fertile. When we returned I gave him a good dose of thoroughwort tea, which operated well. We concluded to stay all day, and in the afternoon I was better. We stayed all night at the same house. The people were very kind. The landlord was much better.

July 19th. In the morning I felt quite feeble, though better. We took breakfast and started up the river. The landlord offered to pilot us up the Little Chain, which was near. The women and I went on shore until the boat came up, and then we passed up the river twelve or fourteen miles, went on shore, got some milk, made mush, and took dinner about 5 P. M. There was a hard shower, it looked like rain, and we concluded to put up for the night, but could get no lodging unless we stayed in an uninhabited house which was all-to-pieces, so we proceeded on up the river two or three miles, passed one strong rapid, and as the sky had the appearance of a heavy rain we went on a sand beach about sunset, covered our boat with our sails and prepared for night, there being no house within four or five miles on our way.

July 20th. All hands pretty comfortable. We went up two or three miles and ran onto the limb of a tree which was sharp and lay concealed under the water, so that I could not see it, and it made a break in the garboard, struck under the boat's starboard bow. We soon found she took in water, and ran on shore, found the leak, put in some calking, then went on two or three miles farther, took breakfast on the beach, then proceeded on in sight of Vincennes, hauled our boat on shore, mended the breach, cleaned our boat, loaded up, went up to the town, about one and one-half miles, where we arrived about 2 o'clock P. M. This is about 170 or 180 miles from the mouth of the Wabash. The river here is about 270 yards wide and not more than four feet deep. We saw horses ford the river one-half to three-quarters of a mile below the town, though the river is very low at the town. At our landing we excited the curiosity of the inhabitants, and there were many of them of all ranks who came down to the shore to know where we were from, and to admire our boat, which was different from any ever seen at this place. I soon became acquainted with some of the inhabitants, in particular Thomas Jones, who had been an Indian trader for twenty-eight or thirty years and had acquired a large fortune by the trade. He informed me that former Governor Posey and the present Governor Jennings were now in town. Governor Posey is the present agent for Indian affairs, therefore I thought it advisable to have an interview with them in the morning, so we entertained the curiosity of the inhabitants with the relation of our voyage, which appeared very interesting to them.

The following is a copy of the letter of introduction presented by Thomas Dean to Governor Jennings:

To the Honourable Governor of the Indiana Territory and to the Agents of the several Tribes of Indians in said Territory.

Gentlemen:

Having been informed that a certain tribe of Indians residing near White River in your Territory have proposed to grant to the New Stockbridge and Brothertown Indians, who now reside in the Counties of Oneida and Madison in New York State, a certain tract of land upon certain conditions,

We, therefore, as Superintendents of the said New Stockbridge and Brothertown Indians, beg leave to represent that they are now about to set out on a journey to that country to accomplish that business, and that they have agreed with Mr. Thomas Dean, an inhabitant of the County of Oneida, to accompany them and to be their agent to negotiate with said Indians, or their agents in your Territory and as we are personally acquainted with Mr. Dean, we do not hesitate in recommending him as a suitable person for that purpose, and as a gentleman in whom you may place the greatest confidence.

Any assistance which you can afford him in transacting his business will be considered a singular favour and gratefully acknowledged by your humble servants.

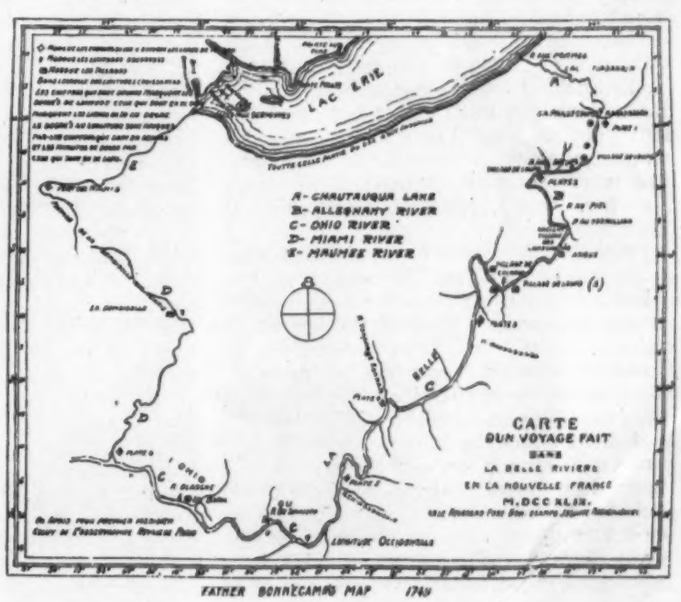
ASABEL CURTISS DOOLITTLE,
JOSEPH STEBBINS,
Superintendents of Indian Affairs.

Paris, N. Y., 12 May, 1817.

July 21st. I took breakfast with Wheeler Mallett. He and his brother Baldwin were unwell. I then went to see the agent for Indian affairs. I gave him my credentials and explained to him our expectations and wishes. He appeared to be very friendly, and said he would aid us; that I had better consult Governor Jennings on the subject, though he had no control of Indian affairs, or of the public lands. We went to see the Governor, but he was three miles out of town, and it rained very hard. We gave over seeing him until the next morning, as we were told by the receiver of public money, with whom he resided, that he would be in town in the morning. I became acquainted with Doctor Lawrence S. Shuler, who had been on board our boat yesterday. He took a brief account of our voyage with intention of publication. We conversed on the subject of civilization and internal

Celoron, chevalier de l'ordre royal militaire de Saint Louis, and a captain, in 1749 made a voyage over the same rivers and through the same territory that Thomas Dean did in 1817, except that he ascended the Miami River instead of the Wabash.

Celoron was under the direction of the Marquis de La Galissoniere, cemmandant of New France, his object being to reclaim the country for the King of France. The map of this voyage is here reproduced.



FATHER BONNECAMPS MAP 1749

FROM THE INDIANA SENTINEL

THE following is the article which Dr. L. S. Shuler wrote describing the voyage of Thomas Dean, published in the Indiana Sentinel at Vincennes, Ind., July, 1817.

"The extensive inland navigation of the western country, is strikingly exemplified by the late arrival at this port (Vincennes, Ind.), (Sunday, July 20) of the elegant schooner built boat, Brotherton Enterprise of six tons burthen, from Rome (Deansboro, N. Y.), in fifty days—this boat left the Mohawk River (Oneida Creek), on the first of June last, under the command of Thomas Dean; and is navigated by four Indian men, accompanied by two Indian women, and an Indian boy, all possessing habits, manners and education indicative of the most complete and refined civilization. The object of Capt. Dean and company, we understand, is to obtain from the Wabash Indians the cession of a tract of land for the Brotherton Indians, in consequence of an invitation given by the former. They intend to ascend the Wabash to its source, and by a short portage, to pass over into the Miami of the lake, by which they calculate to return. The whole route will, they calculate, be performed by the first of September next, making (in the short space of three months, including the time spent in curiosity, business and the necessary detention of bad weather), a journey of between two and three thousand miles—belting the states of Ohio and Indiana, and part of the states of N. York and Pennsylvania. In circumnavigating this extensive area, which contains between 80 and 100,000 square miles, they have only to pass three short portages of about thirty miles. From Rome (Deansboro, N. Y.) they passed through Wood creek, into the Oneida Lake, from which they descended the Oswego river, into L. Ontario—coasting the south side of that lake, to the Niagara Falls, they carried their boat on wheels from Queenston to Chippawa, (a portage of eleven or twelve miles), into the Niagara river—ascending the Niagara, and coasting the north side of lake Erie, to the mouth of Catoragus creek, and up it to a portage of eight and a half miles, over which they passed into Chatauque lake, and down the Conewongo into the Allegheny. The Allegheny, Ohio and Wabash, present a smooth and uninterrupted navigation to the head of the Wabash, a portage of nine miles, connects the Wabash with the Miami of the lake, over which Capt. Dean intends to transport his boat, and descend the Miami into lake Erie, he will coast that lake to Buffalo, N. York. In the spring of the year during high water, boats have frequently passed and repassed by water, from the Wabash to the Miami of the lake, without unloading.

"What a striking view, does not this give of the future relative importance of the western states. The waters of this country, are generally speaking navigable to their source, for boats of considerable burthen, and in numerous places, the waters leading into the Ohio, are connected by short portages, to the navigable waters of the lakes—indeed from the Illinois river, boats can frequently, at a high stage, of water pass into lake Michigan, as easily as from the Wabash into lake Erie. Had Capt. Dean ascended the Illinois, and thence into the lakes, he would have doubled the length of his route, and circumnavigated twice the extent of territory which he now will. If the contemplated canal through the state of N. York, is ever completed, and if the waters of the Ohio, were connected by canals with the lakes, I think the opinion may be hazarded, that the states of Ohio and Indiana and Illinois territory will, in time become more populous and rich than any other equal extent of country, in the United States."

navigation; he proposed making some remarks on both those subjects in his publication. He is a very sociable gentleman and introduced me to Samuel Dilworth, printer, at Vincennes, of the Indiana Sentinel. I left with Samuel Dilworth the copy of Joseph Hull's Spelling Book for examination. We had a rainy day until night; put up at the same place, John Longe's Inn. I saw several people from the State of New York, who were glad to meet us, and we them. Met Mr. Brown, son of Oliver Brown of York State.

July 22d. We went to see the Governor at the receiver's office. He was there, but it being an improper place for a conference, it was proposed to meet at the inn at 11 o'clock A. M. We then proceeded to Governor Posey's, according to appointment, which was at 10 o'clock. We met him and found him an agreeable old gentleman, as I before thought him to be. We had some conversation on our object, but the interpreter, Barron, did not bring the chiefs and people of the Weas, as was expected, so we returned and met the Governor of the State according to appointment. He is a talking man, and I think no great friend of Indians. We explained our business to him. He in a very pleasant way raised many obstacles. The first was that no person had a right by law to contract with Indians for lands. I answered him that I knew of no law to prohibit one nation of Indians from treating with another for the possession of their lands, which was agreed to by his excellency. Second objection was that the United States wanted to purchase a large tract of land north and east of the purchase of 1809, so as to extend it quite across the State of Indiana to the State of Ohio, that the strength of the State of Indiana might be concentrated and the public safety rendered more secure by extending the whole population throughout the interior of the State. It was answered by me that the small piece of land, say 20,000 acres, could bear but a small balance in discomposing the forces of the State, but would perhaps supply it with as good inhabitants as though it were purchased by the United States and sold by the government, or as good inhabitants as were now in possessoin of the land heretofore purchased, and now settled with those who call themselves white people; which was admitted by the Governor. The third objection was that the United States Government had granted two miles square to the State of Indiana on some of the unpurchased land for a site for the seat of government, and we might choose that place and then Congress would not acknowledge the conveyance. I replied that if we chose a place suitable for the seat of government we would give the State the two miles square out of the land we agreed for. He said that would deprive the United States of the profits of the sale of the quantity of lands we possessed around the seat of government, but if we would take land at the head of the Wabash, he said, he thought there would be no objection. We replied that we were not partial to the White River or any other place provided the lands were good and well watered. After some further conversation our conference broke up.

We parted and went to our quarters, and understood that Governor Posey had sent the interpreter, Barron, to our lodgings, wishing us to go to his quarters. We went and met the agent and the two Wea chiefs, with five or six of their men, and presently the interpreter came in, and we communicated to them through the interpreter our wishes, that we had come to make them a visit, and run the chain of friendship between us, and that if it were pleasing to them and their people we wished to come to reside in this country, and we would wish to meet them and the rest of their brothers with our brothers, the Delawares, Miamis, Eel River and Mississinewas, at White River or some place that they would appoint to have a council, and we would go and visit the Delawares and other tribes and meet them. The agent replied that he and the interpreter would be at Fort Harrison in two or three weeks with the goods for the Indians' annuity, and that would be the most proper place; to which the Indians agreed, and it was therefore agreed we should meet them at Fort Harrison in twenty-five days from that time, and that we would go and visit the Delawares and give them notice of the council. Then the chiefs replied that they were glad to see their brothers, the Wapenocas, and said they always liked to shake hands with them, and that they would be glad to meet their grandfathers, the Delawares, in council with us, and that we must go and fetch them to the council. They would think that it was not good, or that their grandfathers were not pleased with it (*as we had told them we had sent four men to visit them six or seven years before, and of the report that they brought back).

*The remark in parentheses refers to a treaty made with the Delaware and Miami tribes in 1809. A petition of the Brothertown Indians drawn up by Thomas Dean, and presented to President Andrew Jackson in the year 1829, contains the following statement:

"In the year 1809 your petitioners (the Brothertown Indians) sent a delegation to the Delawares and Miamis, in the then Territory of Indiana, who made an agreement for a tract of land on White River, in the State of Indiana, in the most solemn manner, agreeable to the ancient custom of the Indians, but before your memorialists could remove onto their newly acquired lands the Government of the United States purchased the whole country of the Miamis and Delaware Indians, by which your petitioners lost their lands and all that they had expended in acquiring them."

We replied that we could not promise that the Delawares would attend, but we thought they would. They said they could do nothing without them, if they did not come. So we shook hands and wished each other well until we met at Fort Harrison, and so parted. We returned and made some preparations for starting up the river, and I wrote home while at Wheeler Mallett's, he not being much better or his brother either.

While going to the postoffice to put the letter in, Governor Posey saw Thomas Isaac and me going by. We had some conversation on Governor Jennings' sentiments as to our business, and he wished that his communication might be kept confidential, what had passed between us heretofore, as it relates to our business with the Governor. We parted; he went to our boat, we to the postoffice. We then returned to take our departure from Vincennes. When we arrived at the boat the Indian agent was there, and the goods for the Indians had arrived which were going on to Fort Harrison, but he said he would not give notice of a distribution until about the time of our treaty.

Voyage from Vincennes to Fort Harrison

We parted and left Vincennes about 5 P. M., ran up the river and stopped at Fort Knox; got water, but it was not very good. This is about three miles, and we went on until dark; encamped in our boat on the Indiana shore near a small brook, there not being a house near shore.

July 23d. Started in the morning and ran up until we came to a house on Elese's Prairie, which is on the Illinois side and is twelve miles long and seven or eight wide. We obtained some milk, made mush, took breakfast on the bank, the house not being near the river, then we passed on around a point and came to the prairie again. We went on shore and viewed it. It is a very handsome piece of land and settled in some places. We went around another bend and came to it again at ——— Ferry, where we went on shore to get some good water, potatoes, etc. They had some noodles. We took some bread and butter; went on until night, when we were about to camp on the beach, but by blowing the horn we found a house by the barking dogs (which abound in this country) about one-half mile from shore. Here we secured the liberty of lying on the floor, and some milk; supped on bread and milk. We lodged on the floor with satisfaction. R. Fowler and P. Dick were comfortably lodged in the boat. We stayed about three miles below the Shaker settlement, and it was said thirty miles from Vincennes. I paid four shillings.

July 24th. We went up the river about three miles until we came to McCarter's Ferry. Went on shore to the settlement of Shakers' which is called the Busero Prairie, which is about four miles wide, seven or eight miles long, and I did not understand the width, but it appeared to be extensive. The Shakers have about 1,500 acres of land here and several other lots in other places, some in the State of Illinois, where they expect to build mills on the Umber Creek, which flows in below Vincennes. We wanted to get some flour and other provisions which we could not get at so good advantage at any other places. The flour could not be ground until near night, and they bid us welcome to stay with them, so we concluded to put up for the day and night. It was now about 3 P. M. There were some of the principal men who came to the boat and went out in the river with us to see how our boat would run; then some of us went up with them, leaving R. Fowler and P. Dick to keep ship. We viewed their plantations more fully, their gardens and orchards, which appeared to be well cultivated, all in proper order. They were getting in their wheat, which was good. I saw some which they assured me did weigh seventy-three and one-half pounds to the bushel, and I spoke for some to bring with me, but did not think of it again when I came on board. We were conducted to a house where we were to lodge, and entertained with a great deal of apparent disinterested friendship.

We attended their evening service, where they sang a hymn, then sang and danced two or three times, broke up, and we repaired to our quarters. We were called to another house across the street to sup, where everything appeared to be kept in good order by the women. We supped and retired to good lodgings in the apartment allotted to us, they having ground our flour and sent it on board the boat at evening.

They spoke of many losses and hardships they have had in consequence of the war, and that they thought Tecumseh and the Prophet had been very much misrepresented, they and their people appeared to be peaceable people, and that they were in his opinion Christian Indians, opposed to war, and he thought it was an unguarded expression of General Harrison to one of the Pottawottomi chiefs by the name of Winemank that caused the battle at Tippecanoe. The Prophet Cala-la-wissa and his adherents did not join in the battle, but the Prophet withdrew across the river; that there were not more than 250 men engaged in the battle out of 800 which had assembled at the Prophet's town for the purpose of information, or of religious devotion; that they were well acquainted with the Prophet and believed him to be a peaceable and a good man.

July 25th. In the morning the trumpet was blown for exercise about 4 A. M. and each family (four in all) repaired to their different places for labor, which was short, and then they went to their business. They conversed freely on the subjects that we introduced. After finding that we wanted to purchase some sole leather they ascertained the quantity we wanted, gave us a piece, for which they would take no pay, which was as much as we wanted, viz.: four or five pounds, besides some garden sauce, in the whole to the amount of $5 worth. We took our leave of them at the mill and proceeded to the river. Two or three of them followed us and spent some time with us at the river. I gave them some pamphlets to distribute at discussions. We parted with them with gratitude and respect, went on up the river, stopped at a Frenchman's house, fifteen or sixteen miles, where we put up, some on the floor and some in the boat. We got some milk and took supper.

July 26th. Started and took breakfast five or six miles upstream. Obtained some milk on a high bluff of rocks or sandstone and had a view of Lamonts Prairie, where we went on shore two or three times to see the country. It appeared to be delightful. We continued seventeen or eighteen miles and then we took dinner. Some went to the house, and some were in the boat. We had some buttermilk to drink and waited till the rain was over, when we went on five or six miles, went on shore, put up for the night and lodged in the boat five or six miles below the Union Prairie. We came about twenty miles.

July 27th. We started and went up to Union Prairie. They have just laid out a town on the bank of the river and so far back into the prairie that the banks are high and pleasantly situated. The village is to be called York. There are several New York people in the neighborhood, one by the name of Richardson, who is a proprietor of the village. We came up the river twelve or fifteen miles and encamped on the river bank near a house, where we got milk, but we lodged on board.

July 28th. Obtained more milk, took

breakfast, and went on up the river. We saw some very large fish, but could not spear them. I threw the spear at one small pickerel and killed it. It would weigh two or three pounds. Saw many wild geese and some turkeys. Went seven or eight miles, stopped at a ferry, and secured some milk and potatoes. Started about noon, went up ten or twelve miles, and put up on the beach four or five miles above Prairie Creek Prairie, where we went on shore. It is a very handsome place. We saw very large flocks of geese. Paul Dick shot at some and R. Fowler shot one flying, but got none.

July 29th. We went up the river four or five miles, went on shore, and ate breakfast. I went back about a mile into the woods and found a house on the Honey Creek Prairie, and procured some cucumbers. After breakfast we passed on eight or nine miles and came to a place called Terre Haute, where there is a village laid out. We stopped a few moments and went on. There was a hard shower and a hurricane. We went on the bank and waited till it was over and then went up to Fort Harrison, where we arrived about 7 P. M. This is about twenty miles that we came today and about 140 miles from Vincennes. We put up at John A. Lafond's, who had no family, but kept house and a little store.

Journey from Fort Harrison to the White River Country and Return

July 31st. We prepared by washing our clothes, baking bread for our journey, and storing our goods. The women finished washing the clothes that were not washed yesterday, and we began to unload our goods and stored them at John A. Lafond's, where we put up. Major Chunn offered to put our boat under the care of the guard at the fort, that it should not be injured or taken away.

We had our goods all stored, made a chain, fastened our boat near the fort to a stump, put the oars, poles, etc., into the blockhouse, and prepared to start, but we could not get ready until it was too late in the afternoon. The Indian who was going to wade Eel River and pilot us agreed to wait until morning, so we made preparations to start early in the morning. In the evening John A. Lafond and another man informed me that we had best not start too early, as an Indian had told them that twenty or thirty of the Pottawottomis had come from Chicago, were hostile, and if they came across us they might injure us. We thought it was a false report and concluded to start as soon as we could.

August 1st. We put up what clothes we wanted to take with us and some bread. They told us we could go through in three days if we had horses, it being one hundred miles, so we concluded to take three days' provisions and get horses if we could, but it happened that there was not more than one pound of meat put up. We took three guns and an ax, started about 10 A. M., and our guide went on with us. The weather was very warm, and we had to go through the prairie, about seventy-two miles, which was very hot and uncomfortable. We could get no water to drink until we went about thirteen miles, where there was good water and a family lived. Here they gave us some milk to drink. After we had refreshed ourselves we left two guns and proceeded on. We traveled very fast until we came to Raccoon Creek, a large stream that runs into the Wabash twelve or fifteen miles above the fort. It was deep. Our guide went across and got a bark in the form of a canoe, took packs across, and Jacob Dick rode his horse across; the others waded. It was near up to their arms. I got some wet, as well as the rest, and it was very warm. We went on in our little path through the woods up the creek three or four miles, made a fire, and lay on the ground. Being very sweaty, and having no shelter, I took cold. We ate a piece of meat and laid down.

August 2d. We took a piece of bread and a small piece of meat for breakfast. It thundered, and as we went on in the little path it soon began to rain. I was very sore and stiff, so that I could hardly travel. It rained very hard, which made it worse going, and being wet with sweat all night, and now wet with rain, I was very uncomfortable. We went on some miles and stopped under the trees to rest, then went on again until fatigued, then stopped and made a shelter of bark and built a fire. Our guide would not wait for us, so we let him go on. It was so bad going through weeds and brush that we stayed about one hour until it stopped raining, went on through mud and water some miles, and then came another shower. We reached a shelter of bark, made a fire, and stayed until the rain was over. As we went on we met an Indian man, woman, and boy, with two horses, going to the fort with skins, etc. We traveled until near night, made a shelter and fire, and camped for the night. We had a good fire, took a small piece of meat and a piece of bread, and obtained what rest we could to meet the fatigues of another day.

August 3d. In the morning we refreshed ourselves with some bread and water and started on our journey, it being the first day of the week. We followed our little path, crossed Raccoon Creek and its branches two or three times, and expected soon to come to the Wea village. About 12 o'clock we came to three or four bark cabins of the Weas, where our guide lived with his relations. None of them could speak English. They brought us about a quart of boiled corn, which we soon made way with. We tried to get a horse, but they made signs that we must stay there that night, for we could not get through to the village. I did not feel like traveling much farther on foot that day, and towards night one of the family who could speak some English arrived. He said we could have a horse to go through to the village next day for $2, and some one would go with us. They gave us some blackberries to eat and at night they sweetened some for us, and showed us some barks we could lay on in a cabin by ourselves. We lay on a kind of stage, with barks on, with our own blankets to cover. As near as we could tell we were about sixty miles from the fort.

August 4th. This morning it thundered and there was a hard shower of rain and some hail. It soon cleared off, and they gave us about three pints of boiled corn, which we ate. We had but two spoons to use among five of us at this place. The women boiled some dried venison for us. We could only get one horse. My companions went forward and left me to follow. When we started, which was about 8 o'clock, the old man went on foot to ride my horse back, and his son, the one that came from the fort with us, rode with me and took part of our baggage. We traveled hard through the woods, brush, weeds, etc., in a small path, it being very muddy and in some places swampy for many miles. We overtook the old man, and then my company. They went very fast, sometimes on the run. We startled many turkeys in our way, one of which Fowler killed with his staff, having left the other gun and the ax where we stayed, but we took a hatchet. Jacob Dick took a turn on horseback. I went on foot awhile to rest him. We continued traveling rapidly until we came to the village, about 5 P. M. The village is on a prairie containing thirty or forty houses in different places. I had a letter of introduction from Lit Lafo to the French trader at the village. He invited us to his cabin to lodge. The man who rode with me shot a young deer as we rode along. We had some of it cooked for our supper. There were many Indians who came to see us where we put up, and we engaged two horses to go to White River, one for me and one for Jacob. We came about thirty-five or forty miles this day.

August 5th. We took breakfast early this morning. Thomas, Paul, and R. Fowler started on foot and left Jacob and me to come with the horses and bring the packs. We had to give $1.50 for each horse. We started about 9 A. M., in company with four or five Indians, men and women, and passed the woods as fast as we could. The path was bad, over a swamp or muddy ground. We traveled all day as hard as we could, but did not overtake the rest of our company. We startled many turkeys. We camped on the ground at night, made a fire near the other and lay by it, and there came up a man and woman, who camped a little way off. They brought us about a pint of sweetened hoecake, which was very good, having nothing to eat since morning. We ate that, drank water, and laid down for sleep. At dark a young Indian came up to our camp, who was going to take my horse back. He had killed a young raccoon as big as a cat. They burned the hair off of it, then boiled it without salt and gave us some, which we were glad to eat. We then tried to get some

(Continued on page 116)

Some beautifully built punts at the rowing race on the Thames between the crews of the Universities of Pennsylvania and Leander

The Punts of the Historic Old Thames

A Type of Boat Little Known in American Waters

IT was surely a happy thought which prompted some nameless Briton to take in hand the flat-bottomed, graceless boat known as the pontoon and artfully fashion out of it that remarkable pleasure boat, the punt! Without stem or keel or stern post to aid him, he constructed at one end a sloping runway for poling the craft through the shallows, and at the other a flat counter for the purpose of paddling it through the depths or in mid-stream. Then, in the thwarts, where ordinarily a rower would sit, he spread a carpet of cushions and pillows inviting to luxurious outstretched ease, and lo, the queen of British river craft was there!

In the popular estimation the boat peculiar to the River Thames or the streams at Oxford and Cambridge is essentially an English institution. It has the quality of leisure characteristic of these rivers, and repeats and crystallizes in its exterior the Briton's characteristic attributes. It has common sense. It wastes no time on non-essentials. It is steady and reliable, and, above all, it has that ubiquitous British quality which only the word "comfort" can convey. Slanderers there are who point to its ungainly lines, its needless weight and bulk, its tendency to crawl and loiter, and the general atmosphere of langpor and gondola-like *dolac far niente* which seems to pervade it. But these are libels at which this flat-bottomed, primitive-looking craft can well afford to laugh. For, though it lack the trim of the Thames skiff or gig, or the speed of the Canadian canoe or the outrigger, the punt has none of their discomforts or attendant risks, and in its surprisingly quick response to its master's will it recalls the catboat or its aristocratic cousin of Venice.

But the punt is intolerant of the amateur. It resents the inadequate human propeller, for whom it usually has a few totally unexpected surprises. Let the beginner, for instance, attempt to paddle, and he may find the punt making for that side of the river which he is endeavoring to avoid. Or it may begin to gyrate and twist, to shoot forward when he would fain go back or stop, or it will drift just when he confidently assures himself he has it under full control. In short, like the Irishman's proverbial pig, it is almost sure to persist in a course the very opposite of what was intended, until, adrift helplessly in midstream, or aground on some inhospitable island or shoal, the amateur pilot frantically appeals to some one to rescue him. In poling, it may be said that his initial attempts will be attended with no greater success, though his experiences undoubtedly will be more varied. The long pole, with its iron tip, which he must thrust into the bottom of the river, is an elusive creature of wondrous humors and subtle tricks. It demands sympathy and understanding, without which it develops an inordinate desire to float instead of sinking, to twist in one's hands, to get foul of the boat, and either to precipitate its owner into the river or calmly to wrench itself from his grasp and peacefully float away shoreward, while he stands helplessly looking on.

One might surely say that the true virtue of the punt lies in its essentially social qualities. It has raised the picnic to a fine art. It has encouraged the student, the thinker, the poet, the artist to ply their calling, and whoever saw any of these craftsmen following their bent in a skiff or a canoe! Though it courts solitude, it cheerfully accommodates a family. It takes life philosophically, and teaches the lesson that some of us fail to grasp, that the hour of leisure may be the one most fraught with real profit, that profit which comes of reflection and introspection, combined with a reasonable amount of agreeable toil in the open. With the punt tied up to a grassy bank and shaded by an overhanging limb of a tree, there comes the temptation to draw out a book, a manuscript, or the tools of one's craft. The informing or creative moment is possible in no other type of small boat. The skiff and its kin demand physical toil. They lure to speed, competition, and those common interests which should have been left on shore. But the punt never wholly forgets its mission and its message.

THE Department of Commerce is endeavoring to locate Harry M. Beachy, an American seaman who has been awarded by the British Government a silver medal in recognition of the part he had in saving the crew of the British schooner BUSY BEE. Mr. Beachy was born December 22, 1894, either at Baltimore or at Grantsville, Maryland.

Every effort to locate Beachy has been made but so far without success. The medal is now being held in the Department of Commerce in the hope that some trace of Beachy may be found.

SOME INTE

CHARMING interiors were the rule craft that before the entrance of the prised the yacht fleet. Practically every are now on naval patrol duty, and as the and most durable housing accommodations, beautiful trim and furnishings have been this relatively small way, that

THE main cabin of *Kosagaas*. The side seats may be converted into bunks should the owner be desirous of taking a larger number of guests than the boat has staterooms for. *Kosagaas* is an auxiliary bugeye, a type of boat very popular on the Chesapeake Bay. She was built by A. A. Blow, and is equipped with a Standard motor

PANELED in delicate emborsements of gray against cream the side walls of this stateroom aboard *North Star* are an appropriate setting for this quaint curtained bedstead. There is a charm about furnishings like these that pervades the room from its carpet to its beamed ceiling and marks in the memory a permanent picture of a perfectly furnished sleeping room

A COMFORTABLE lounging room is quite as necessary aboard a large yacht as ashore at the club or at home. This particular apartment is furnished and decorated in white and gray. These pale tones lighted by many windows provide an atmosphere of cheerfulness throughout the whole room

THE steam yacht *Pioneer* was built for George E. Chisolm from designs prepared by H. C. Wintringham. Although she is one of an older type, having been built in 1897, yet her usefulness as a pleasure craft has been great. Both on deck and below, *Pioneer* is equipped with a view to comfort, and how well this has been attained is exhibited by this view in her main cabin

YACHT RIORS

rather than the exception below decks of United States into the Great War com- American steam yacht, and motor yacht too, rigors of war service require the plainest both for officers and crews, much of the put over the side, thus proving again, in war in every phase, is a destroyer

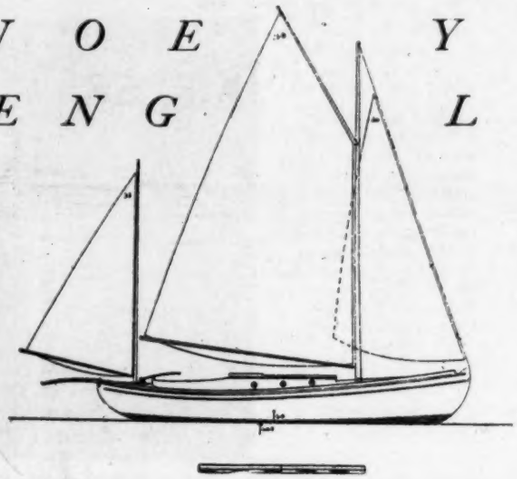
A NAVAL architect must be more than an engineer to design and create a stairway like this, which by the way is below decks on the steam yacht *Niagara* built for Howard Gould. She is one of the largest American built pleasure craft afloat

DAINTY in the white and gold of colonial days this cabin interior of the yacht *North Star*, owned by Brig. Gen. Cornelius Vanderbilt, pleases every sense. The fireplace and mirrored mantle piece, the book shelves, and the deeply paneled ceiling blend and create an atmosphere of home-likeness not always found aboard ship

DONE in antique oak the interior of this yacht with its olden-time rugs and richly carved furniture seems more like the festal hall in some old English manor-house than the main salon of one of the finest steam yachts that cruised Down East season after season before the war with the fleet of the New York Yacht Club

WHEN John D. Spreckels owned the *Venetia*, she was outfitted and furnished in true yacht style and, therefore, from her keel to mast heads was good to look upon. *Venetia*, by the way, was built by Hawthorne & Co., Ltd., at Leith, Scotland, from designs by Cox and King. This is her dining salon

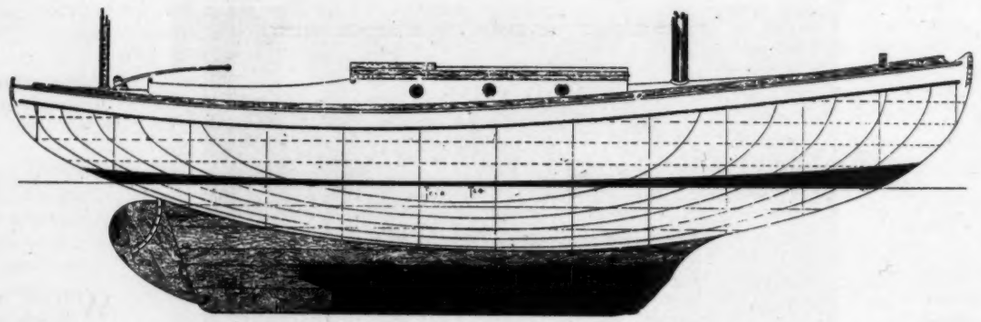
A CANOE YAWL OF ENGLAND

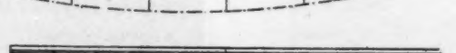


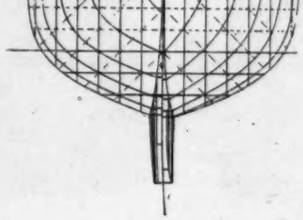
THE canoe yawl is light and may be transported any place by motor truck, steamboat, or railroad train: this coupled to the ease with which it may be rowed or paddled in calm weather and the fact that because it is a small craft of easy lines and light scantlings and a comparatively easy boat for the amateur to build endears the type to many English yachtsmen.

The canoe yawl being a little craft, the length over all is but 22 feet with a beam of 6 feet with little depth of hull, presents difficulties in the matter of adequate cabin head-room. This however is overcome in a measure by building the cabin with a lifting top so arranged that while the vessel is at anchor it may be raised to sufficient height to gain ample head-room for one to sit upright while cooking, eating or reading. Canvas bellowed, and extended during the time the top is up keeps the cabin dry.

Here is a type of yacht that is especially adapted for use on our great sheltered bays, sounds and lakes. Unfortunately American sailing men know little of these little boats or of the pleasure they are equal to affording.







Lloyd's Register of American Yachts, 1918

CONDITIONS in England at the beginning of 1915, after six months of the great war, left no ground for question as to the necessity for the suspension of Lloyd's Register of British and Continental Yachts; and after continuous publication for 38 years the work was discontinued for the duration of the war. When the same question arose last Fall in relation to the Register of American and Canadian Yachts, the answer was not so obvious, and after serious consideration of the condition of American yachting at the end of last season, and of the war outlook, it was decided to issue the Register as usual in 1918. Whether this was a wise decision from a financial standpoint for the publishers depends now upon American yachtsmen and the yacht clubs, but in any event yachting is the gainer in the very complete record which was sent out last month.

The new Register of American Yachts is identical with its predecessors in all respects except in the omission of the plates of flags, making a somewhat thinner volume. The printing of the flag plates, usually some 600 club burgees and the private signals of some 2,000 yachtsmen, is under the most favorable conditions one of the serious problems connected with the production of a yacht register. The one process by which satisfactory results can be obtained is that of lithography—printing from stone—a separate stone being necessary for each color. In the case of the Yacht Register seven sets of stones are used, and every flag must be re-drawn on stone each year. The process is not only slow, necessitating the commencement of the work early in the year, but very expensive, even in ordinary times; the cost of such work to-day makes it out of the question without an increase of price which is in itself highly undesirable in the present state of yachting.

The compilation of the book has been a matter of exceptional difficulty this year; many yachts are under Government ownership or control, and it is not permissible to publish definite information concerning them. A large number of yachts have been sold for commercial purposes, their new owners having no interest whatever in yachting and taking no trouble to answer inquiries concerning them. Many yachtsmen both individual owners and club officers, are in active service, and inquiries have failed to reach them or there has been no opportunity for a reply. The new book, however, contains the particulars of 3490 yachts, only 136 less than last year, though building has practically stopped. The usual complete particulars are given, including much information as to new engines, but in some cases it has been necessary to omit the names of owners. The list of clubs and associations includes 556 organizations, only 27 less than last year.

There is the usual list of the owners of all the yachts, with clubs, addresses, etc., a list of former names of yachts and a list of signal letters. The Trade Directory section has been thoroughly revised and offers a complete guide of all manufacturers and dealers concerned in the production of yachts and yacht supplies from the largest steam yacht down to a spark plug. The book is published by Lloyd's Register of Shipping, 17 Battery Place, New York, the prices being $8.50 for the blue cloth edition and $7.00 for the plain canvas.

FREE INSTRUCTION IN SHIP DRAFTING

A FREE evening course in ship drafting will be opened to men at least sixteen years old at Cooper Union, Cooper Square, N. Y. City, on September sixteenth. Applicants must have had either one year's instruction in mechanical drawing or a similar length of time in a drafting room. The course will be three evenings a week and will last about thirty weeks. It will be in charge of Mr. Gerald T. White who will take up in detail the various types and construction methods used, and who will instruct the students in the proper method of presenting the construction on paper. Towards the end of the course the students will have an opportunity of designing a small cargo vessel complete from the making of the lines to the arrangement of the cabins.

There is hardly a ship yard or naval architect in the country that is not in immediate need of draftsmen at good wages, and a course of this kind should be very popular. Applications for admission will be received at the office of Cooper Union in person between 9 A. M. and 5 P. M. or by mail not later than September 7th, with the exception of Saturdays.

Showing Clearly One Never Can Tell

ONCE upon a time, fully eight or nine years ago, we had a steward at the Club who did not prove very efficient and was discharged after four to six weeks of service. Recently, one of our members had occasion to employ the aid of one of the most prominent detective agencies in the United States in connection with his business. Meeting the General Manager of this concern, he asked to be remembered to Mr. Elmer Story and Mr. Johns, of Bayside, whom he knew when he lived in that town. The incident was reported to these gentlemen, who said that they did not recall at all the name of the man in question as a resident of Bayside, which fact was in turn reported back to the General Manager of the detective agency. He laughed at this and said that these gentlemen would undoubtedly recall him as a steward of the Bayside Yacht Club many years ago, and a poor one. In fact, he was no steward at all, but was at that time in the U. S. Secret Service and took the job to watch certain people in the neighborhood of Bayside, Flushing and Whitestone, who were suspected counterfeiters. That was why he made a bad steward, but he held on to his job long enough to get the information he wanted.

—Bayside Log Book.

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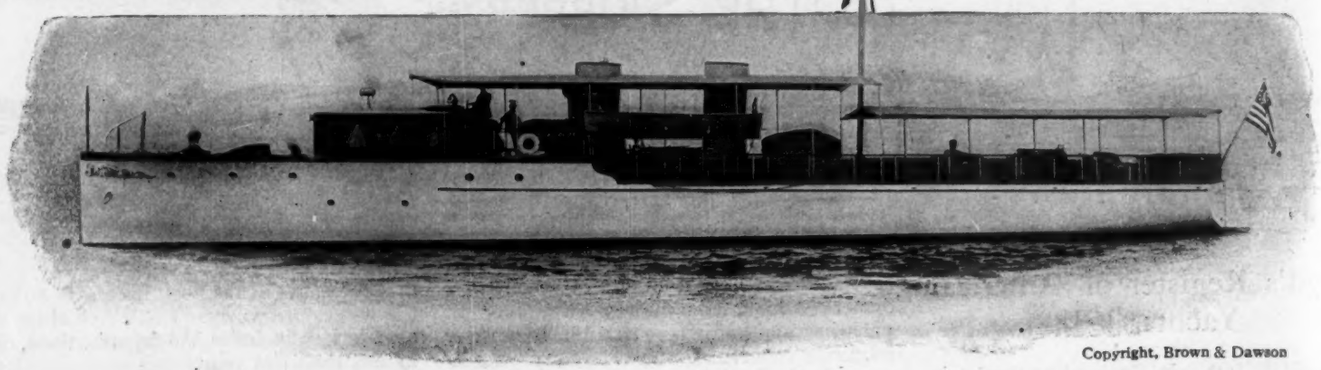

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Aurore, a 96-Footer, built by us for Mr. Stuart Wyeth.

100 Minutes at Zeebrugge

(Continued from page 99)

much nearer us, beyond stray shots. I think the western batteries were still waiting for the fictitious landing party somewhere Blankenherge way. Credit for the success of our run is very largely due to my Number One, Lieut. Gordon Ross, who carried on during the whole action with a broken finger, superintending and assisting in the dropping of the buoys, no light articles, and awkward to handle on the narrow gangways of an M.L.

On our way to the rendezvous we waited for about half an hour off Zeebrugge in case we could be of assistance to any men or vessels in distress. Vindictive, Iris and Daffodil we knew had gone, for they were working to a schedule of time, but we saw nothing, though we kept a good look out for pursuing German craft. Apparently none came out. I think they were too rattled, and too thankful that the British had done, to worry about pursuit.

Then full speed for the rendezvous, but there were no ships there. And so on, still full speed, for Dover. I shall never forget that run, tearing through the blackness of night "all out." About half way we had a bit of excitement, a dark shape was sighted upon our port bow; it was a ship of sorts and looked very like a submarine. We challenged it at once, and by its reply we knew it to be a friend, so we closed it and discovered that it was an M.L., curiously enough one of our own unit. They also had seen no one since leaving Zeebrugge, so we sped on in the darkness together. When dawn broke we were still out of sight of land and a slight haze on the water made visibility bad. The first thing we picked up was a wreck on the Goodwin Sands, which loomed up out of the mist rather nearer than we thought ourselves to be. Soon the white line of breakers warned us that we must alter our course to the northward. We reached Dover Harbor just as Vindictive had entered. That entry will be in my mind for ever. About six M.L.s. were converging out of the fast clearing mist, and I am afraid we all raced for the western entrance. Our ship won; and had the honour of being the first M.L. to enter harbour from the Zeebrugge action.

Then came what was to me the most stirring part of the whole affair. As the six M.L.'s. passed Vindictive, battle-scarred and covered with the signs of her wonderful fight, all eyes were turned upon her and the men who thronged her deck. Then those men, remnants of the landing party and the ship's company, each of whom deserved the V.C., waved their caps and cheered again and again as the M.L.'s steamed slowly past. We could scarcely believe our ears that these men, whom we felt we ought to be cheering, actually got in first with a cheer for the M.L.'s who had helped them in their wonderful achievement.

That cheer went home straight to the heart, and its echoes will sound there till my dying day. Our little ship's companies replied lustily and our sirens added their voices. But to be cheered first—well, I am not ashamed to own that a lump came into my throat. To lead the first M.L.'s into harbour from Zeebrugge and to be cheered by Vindictive's crew—it seems like a dream now that I look back upon it.

During the next few hours the M.L.'s returned to port in driblets, some bearing the marks of their narrow escapes from enemy gun fire or collision in the fog. These hours were anxious ones for us, waiting to learn who was safe and who had fallen. At length all had returned but two, and of these two we had received reports of their loss. Then we knew the fate of all who had gone into action with us. The feeling in our hearts were mixed: genuine sorrow for the good comrades who had made the Great Sacrifice and thankfulness at our own escapes, and, being human, a certain amount of pride that we had helped in an action that will live in History.

(Reprinted from Yachting Monthly)

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Astronomy

(Continued from page 95)

Almanacs of late years has been an admission that it has lost much of its former usefulness.

In passing it may be said that it was both difficult to observe and the reduction of observations something of a feat, including consideration of horizontal parallax, and the results open to large residual errors, even when often repeated.

THE PLANETS

The only remaining bodies are the four planets, Venus, Mars, Jupiter and Saturn. Inasmuch as the stars are much more convenient both to find and to calculate upon, it seems hardly necessary to consider the planets further than to indicate something of where they may be found, in order that they may not be mistaken for the fixed stars.

The orbits of the planets all lie within a few degrees of the plane of the earth's orbit, and therefore any star which in declination differs considerably from the plane of the ecliptic, as indicated on the Star Map of the Almanac, is not in danger of being confused with one of the planets. Reference may also be made to the positions of the planets, as mentioned below. Indeed, for one who views the heavens nightly from a position so advantageous as the deck of a ship, and who makes use of the stars, it would seem natural that he would, as a mere matter of interest, keep track of these four bright planets. Venus appears alternately as the morning and evening star, never getting far from the sun, as its orbit is inside that of the earth.

The other three have apparent motions backward and forward in the heavens, which very well justified the title of "wanderer" which was given to them by the ancients. Their right ascension and declination are given for each day of the year, so that for any given day their location among the stars may be readily jotted down. They move so slowly, however, that it is no trouble to know where they are.

The foregoing statement of the relations of the heavenly bodies is sufficiently exact for navigational purposes but it ought to be said that for some other purposes it would be very inadequate.

The unchanging length of year and the unvarying speed of the daily revolution of the earth on its axis are somewhat exceptional facts. Slow periodic changes seem to be the rule.

The inclination of the pole of the earth to the plane of its orbit varies through about three degrees in a cycle of 30,000 years. In 80,000 years the form of the orbit changes from nearly circular to its extreme limit of eccentricity and back to nearly circular. In 108,000 years the line of the major axis of the orbit swings around the sun once. The earth is set forward and then backward on its orbit by the attraction of the moon and also varies a little above and below the plane of the orbit, and the sun moves through space, carrying the planets with it, a distance about double the diameter of the earth's orbit each year, in a direction approximately declination 31° north and right ascension 17 h. 50 m. And the stars also move through space at varying speeds of about 20 miles per second.

The Almanac takes some of these various changes into consideration but the navigator is fortunate in not having to reckon with them.

THE NAUTICAL ALMANAC

The present day student may thank his stars for the change made in recent years in the arrangement of the Nautical Almanac, which has condensed it into a smaller volume at a mere fraction of the old price, and has grouped together in a more compact form the items of information which are presumably needed for a single calculation.

To appreciate his good fortune, the student should take a look at an Almanac prior to about 1912, to see the practical improvement which has taken place.

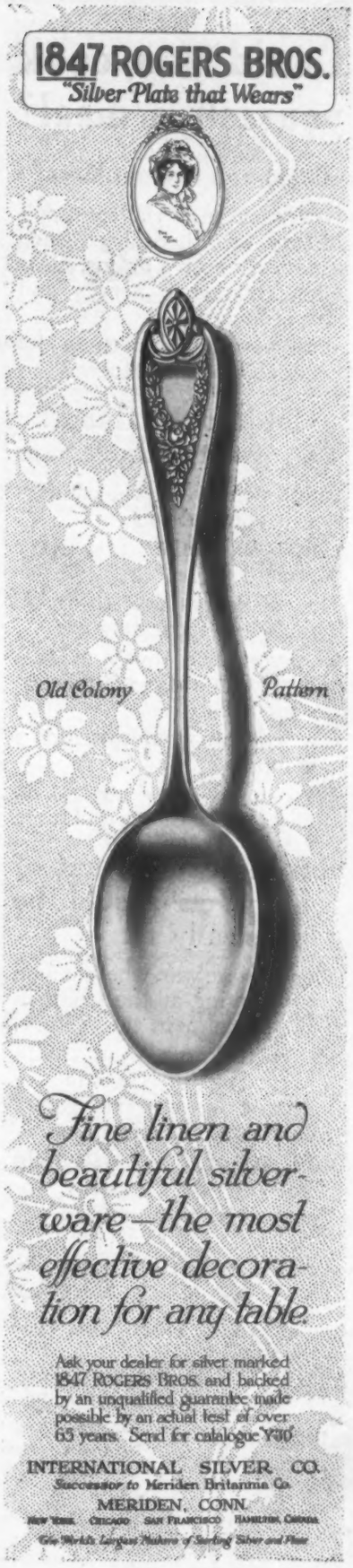
The first two pages of the new form of Almanac cover the whole year in giving for each day the right ascension of the mean sun at Greenwich mean noon, with corrections for every six minutes of the day. This table in fact is produced by adding three minutes and fifty-six and six-tenths seconds (3 min. 56.6 sec.) or three minutes and fifty-six and five-tenths seconds (3 min. 56.5 sec.) to the right ascension for each succeeding day. The corrections will be found to amount to approximately one second for each six minutes, which amounts to 9.9 seconds for an hour and 1 min. 38.6 seconds for ten hours, etc.

The next two pages of the new Almanac give the mean time of sidereal noon at Greenwich. In other words, the mean time at which the zero hour of right ascension passes the meridian at Greenwich. This table, like the other, is made up by a progressive deduction of 3 min. 55.9 sec. per day, and the corrections for longitude, in which longitude is measured in hours, is similar to that of the correction of the preceding table.

The slight difference of about 7/10 second between the amount of daily variance in the two tables is the difference resulting from using the mean time in one table and star time in the other table as the basis for the calculation.

The next two pages are given (1) to the declination of the sun and (2) the equation of time for the month of January for every two hours of each day, and also (3) the semi-diameter of the sun for each tenth day.

These three items are all that is usually needed in working out a sight. The interpolation for time between the given periods is readily accomplished and the two pages take the place of the first page of the old form of Almanac in which the right ascension and equation of time were given only once for each day instead of for every two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hours, requiring a much more important interpolation. The semi-diameter was given for each day in the month in too much detail, and upon the same page, to the confusion of the beginner, was the right ascension of the sun, which he did not need, and the sidereal time of semi-diameter passing the meridian, which by turning to about page 179 he could find was something which he would never need to know anything about. And he had to be careful to note that his information was to be taken from the left hand page, which related to apparent noon, and not from the right hand page which related to mean noon.

In other words, most of the figuring upon these two pages was of no interest to his problem, and the information which was of use to him was either in insufficient or in excessive detail.

Following this for January were two pages of further information respecting the longitude of mean noon, the logarithm of the radius vector of the earth, and information respecting the horizontal parallax of the moon, etc.

Following this were eight pages of hourly information throughout the month as to the exact position of the moon. In other words, twelve pages devoted to January and likewise to each other month in the year, instead of the compact two-pages-for-each-month arrangement of the knowledge actually required and in detail suited to the navigator.

The hourly changes of the location of the moon, its semi-diameter and horizontal parallax are now grouped together in some 45 pages, covering the whole year, and not scattered throughout the book to the annoyance of those searching for other information.

Two pages are then devoted to the moon's transit for each day in the year, followed by four pages each for the four planets, Venus, Mars, Jupiter and Saturn, giving their apparent right ascensions and declinations for each day in the year and their transit time at Greenwich.

In the new Almanac the number of stars for which apparent places are given is increased from 44 to 55, and the detail of all of them, in right ascension, declination and mean time of transit for every day in the year is condensed upon three pages instead of being spread out over 13 pages, with daily variations in both right ascension and declination, amounting in some cases to only a hundredth part of a second of time, and less than a single second of arc. The mean places of approximately 110 additional stars occupy but two pages of the new Almanac, with the amount of annual variation, making accessible to the navigator a large number of stars of the second and third magnitude, if circumstances make it convenient to use them.

Both Almanacs have a star map, showing the larger stars and the position of the sun among the stars throughout the year, but even the map is a recent improvement not found in Almanacs as late as 1908. Also there are details of eclipses and a few convenient tables with several pages devoted to explanations of the tables and pertinent definitions.

Log of a Cruise in 1817

(Continued from page 106)

sleep under the trees, so that we had not much dew on us, but many fleas.

August 6th. They brought us a little piece of the raccoon and some other food which we thought was made of roots, which answered as bread, but I was not fond of it. We went on rapidly until we got through. Traveling along, the Indian who killed the raccoon walked before me and shot a turkey that would weigh fifteen or twenty pounds. We left the settlement about 10 A. M., gave up our horses, and understood that my other three companions had crossed White River. We therefore took the packs, rode through the river and went to the house of William Conner, a French trader, whom I found had gone to Philadelphia. His partner, William Marshall, had gone to Muncie, a town twenty-five miles up the river. The women could not speak English, but we found they had gone down the river. We went down across the prairie about a mile, crossed the river, and went about four miles to a settlement of the Delaware Indians, carried our packs, and met them at the lower village. They gave us some bread and milk to eat. We invited them to go to Fort Harrison to the council, but they did not agree to go. We returned, crossed the river, and went to Conner's to get a horse to the upper town, but got none. Joe, Paul, and Rudolphus started on foot about half past 5 P. M.; the rest concluded to stay, and soon after William Marshall came home. He said we could not get any of the Delawares to go to Fort Harrison, they were all going to Fort Mayer, to a treaty there the 15th of September, so we concluded to go up in the morning. Marshall would furnish me with a horse to ride.

It is about forty or forty-five miles from the Weas to the White River making about 140 miles from Fort Harrison to White River, and five down and five up makes ten miles.

August 7th. We took breakfast, hired a horse, and proceeded on up to the other town. We reached the settlement about 10 o'clock P. M., obtained some bread and buttermilk, then went on toward the principal Indian village and met Paul Dick with horse going for us. He said the council must be held at the village where Anderson lived. We went up and met several at his house, and appointed a council on the morrow. We were furnished with supper, which consisted of bread and herb tea made sweet, with which we refreshed ourselves. There was a very heavy shower of rain, with hail and thunder, and a violent tempest, so that it was near blowing some of the cabins down. We put up at the house of the

principal chief. It was as good as any in the village, and he a plain, majestic looking man, sixty or sixty-five years old. Paul and F. Fowler were directed to another house to lodge, and the rest of us lodged at the chief's. I had the most comfortable place. It was some boards or staves put on benches, and bullrushes laid on them, and a small pillow, though it was wet in the shower.

August 8th. We got together in the morning and were served with some boiled corn and venison for breakfast. After breakfast the people began to come in, and we were soon served with another dish of squashes, made sweet with sugar, and some bread, which we partook of. After the chiefs and councilmen and principal men of the nation came in they informed us that they were ready to hear what we had to say. I spoke to them as I have written in the appendix, and the reply of Anderson (Keklawhenund), the principal chief, as it is there noted.

There were twenty or thirty Indians who attended the council, which lasted about four hours. We went to look for the horse that I rode, but did not see it. We mentioned that we wanted some provisions to take on our journey, and we were informed that they would be brought in the morning, so we put up for the night, myself, T. Isaac, and T. Dick at the chief's, P. Dick and R. Fowler at another house.

August 9th. Our provisions soon came in. They were hoecake and Indian bread. We received two or three pairs of moccasons. Thomas Isaac found the horse, and after breakfast we took our leave, went down to the Nanticoke village (Nancytown), obtained some buttermilk, Indian wampum, and butter from a woman by the name of Nancy, and then started for William Conner's. In the afternoon it rained very hard and we were very wet. We came down to Conner's about 5 o'clock and prepared to start in the morning for Fort Harrison, to be at the treaty there. We endeavored to get a horse or two, but could not, so we prepared to start on foot early in the morning.

August 10th. Took our breakfast early in the morning and obtained some dried beef to take with us. Settled with William Marshall for the use of his horse and what we had. Paid him $3. We shouldered our packs, waded White River, traveled hard all day, and at dark were within about three miles of Corzeton or the Wea village. I was very much fatigued, as were some of the rest. We traveled about forty-two miles this day in very bad walking. We lay down in our blankets amongst the weeds without fire.

August 11th. Were up by the time we could see, and arrived at Longley's by sunrise or nearly, took breakfast, started on for the settlement on Raccoon Creek, where we arrived about 5 P. M., had supper of venison and lay down early to rest.

August 12th. In the morning we paid $1 for what we had received, started early, traveled as far as we could, and in the afternoon it rained some. We stopped under a shelter for about two hours, then went on. The weeds and bushes were very wet, so that we were very wet ourselves. We put up at dark near the ford on Raccoon Creek.

There is a break here in the journal of eight days. This part of the journal would have contained an account of the conference with the Indiana Indians regarding the sale of land to the Brothertown Indians. The Delaware Indians having refused to join the council, it was quite evident in advance that nothing definite could be attained.

In 1822 Thomas Dean made a treaty with the Wisconsin Indians by which the necessary amount of lands were secured near Green Bay, Wis., to which the Brothertown Indians of New York were transferred. They now live on their land on the east shore of Lake Winnebago.—Ed.

The Log of the Voyage of Thomas Dean will be concluded in the October number

The Sailor's Treasure Ship At Last Comes In

SOME idea of the enormous number of sailors who have touched at the Port of New York during the first year following the United States' entry into the war, may be gathered from figures made recently in the annual report of The American Seamen's Friend Society, 76 Wall Street, at its ninetieth annual meeting. This Society is the only American institution doing work for sailors on an international basis.

The officers of the Society were reelected as follows: President, Dr. John B. Calvert; Vice-President, Anton A. Raven; Vice-President, Dr. Nehemiah Boynton; Secretary, Dr. George Sidney Webster; Treasurer, Clarence C. Pinneo. Rear Admiral Nathaniel R. Usher, commanding Third Naval District, was elected an Honorary Vice-President.

The past year's record shows, among other things, that the total attendance of seamen at the Society's New York headquarters in the Sailors' Home and Institute on the North River water front was 154,000. In addition, nearly 26,000 seamen in this port were reached by personal visits, either aboard ships or in the hospitals.

The sailors evidently had more money than usual, for the Society handled during the year more than $100,000 and this despite the fact that no general banking business is done. At the same time there was an extraordinary number of requests for free accommodations and 1700 free meals and 1500 free beds were given, while about 500,000 rooms and beds were rented and paid for.

Through a system of distribution of loan libraries to ships at sea the Society during the past year distributed 170 new libraries, making an aggregate total of shipments and reshipments of 27,669 libraries. The number of volumes in these libraries is 652,538 and these have been accessible by first shipment and reshipment to 474,804 men. The libraries placed in the United States Naval Vessels and in the United States hospitals, is 1,079 and these have been accessible to 130,000.

During the year contributions were received for the erection of a building to meet the needs of the sailor in the Panama Canal Zone. This amounted to some $40,000 and have made possible the opening of this new work. In additional contributions of $41,000 were received for the general work and $20,000 for the Sailors' Home and Institute at 507 West Street.

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